Microwave Spectra of Molecules of Astrophysical Interest XXII. Sulfur Dioxide (SO_2)

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The microwave spectrum of sulfur dioxide (SO_2) is critically reviewed and supplemented with spectral frequency calculations derived from rotational and centrifugal distortion terms in the molecular Hamiltonian. The primary objective of this review is to provide the microwave transition frequencies applicable to molecular radio astronomy for the ground vibrational state of the most abundant isotopic forms, i.e., the singly substituted atoms ^{33}S and ^{34}S. Also included is an analysis of the lowest lying vibrationally excited state ($\nu_2 = 1$) of $^{32}S^{16}O_2$. The frequency limits and maximum rotational quantum value (J) vary for each isotopic form but for $^{32}S^{16}O_2$ the frequency range 100 MHz to 650 GHz is presented for $J_{max} = 60$.

Key words: intensities; interstellar molecules; microwave spectra; molecular constants; radio astronomy; sulfur dioxide.

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1. Introduction

This review is part of a continuing series of thorough reviews and analyses of the microwave spectra of interstellar molecules identified in the radio (microwave) spectral region. The goal of these reviews is to update and augment the existing spectral data on the known interstellar molecules by providing both measured and predicted rotational transitions over the spectral range covered by existing radio telescopes. In this paper the spectrum of sulfur dioxide is treated. Although only the most abundant isotopic form of sulfur dioxide ($^{32}S^{16}O_2$) has been observed in interstellar clouds, the spectra of $^{34}SO_2$, $^{33}SO_2$ and $^{32}SO_2$ $\nu_2 = 1$ were also analysed in order to provide more thorough coverage of species which may be detected in the future. Although extensive laboratory measurements of

the ^{17}O and ^{18}O isotopic forms have been published, these species are deemed unlikely to be detected with current technology. However, both the measured transitions and molecular constants are summarized by Lovas[1].

2. Organization of Tables

The molecular constants obtained from the analysis of $^{32}S^{16}O_2$ in its ground and $\nu_2 = 1$ state are given in Table 1. Table 2 contains the molecular constants derived from the analysis of $^{33}S^{16}O_2$ and $^{34}S^{16}O_2$. The microwave spectral transitions for each of these species are given in Tables 3 to 6. Table 5 includes the hyperfine-split transition frequencies due to the ^{33}S nuclear quadrupole interaction. Table 7 contains a list of all the calculated transitions reported here, excluding hyperfine splittings, ordered by increasing frequency as an aid to the user.

2.1. Molecular Parameter Tables

The best available data have been gathered for each species and least squares fitted to the Watson centrifugal distortion Hamiltonian[2] and statistical analysis developed by Kirchhoff[9]. The analyses provide not only the molecular constants, but also a check on the reliability of the measured transitions, and provide uncertainty limits for the unobserved transitions which are predicted here. Thus, the spectral information presented in the following tables includes the laboratory measurements, derived molecular constants, and predicted transitions for the isotopic forms of sulfur dioxide. The reported transitions have been limited to some extent by fixing the maximum value of the rotational quantum number, J, and transition frequency. It is felt that these limits are sufficiently generous to allow for all transitions which might be observed by existing radio telescopes.

The rotational and centrifugal distortion constants were obtained from a least-squares analysis of the observed spectral data using techniques published elsewhere[3]. Measurements were excluded from the final calculation when they differed from the calculated frequencies by more than 3.5 times the standard deviation of this difference. The probability that the difference between the calculated and observed frequency will exceed 3.5 standard deviations is on the order of one in one thousand.

Because the data used in the analysis of each of the molecular species reported in this paper were obtained from a variety of sources, the assumption of equally probable errors for each of the transitions included in the fit could not be made. In the analysis, therefore, each transition was weighted by the inverse square of its uncertainty. When available, the reported estimates of the measurement uncertainties were used. In some instances these were not available. In these instances, the uncertainties were estimated by the author. Whenever possible, a uniform uncertainty was assigned to all such transitions from a single source.

For each of the species analyzed the Hamiltonian contained terms up to P^6 (sextic terms). For the ground state of $^{32}S^{16}O_2$ a total of 243 measured transitions were fitted with $J \leqslant 60$. For the $^{32}S^{16}O_2$ $\nu_2=1$ state 90 transitions were fitted with $J \leqslant 60$. For $^{33}S^{16}O_2$ 40 rotational transition frequencies (the hypothetical unsplit frequency) were fitted with $J \leqslant 40$ and 53 hyperfine splittings were analyzed for transitions with $J \leqslant 25$. For $^{34}S^{16}O_2$ 61 rotational transitions were fitted with $J < 49$.

The determinable molecular constants and standard deviations of the fits are listed in Tables 1 and 2. Other molecular constants such as the electric dipole moments and nuclear quadrupole coupling constants are also given where appropriate.

2.2. Microwave Spectral Tables

The present analysis is an extension of a previous review by the author[1]. A significant portion of the measurements are taken from the extensive studies of SO_2 by Dr. G. Steenbeckeliers and Dr. J. Bellet. Without their efforts, this review would not be possible. Inclusion of 45 additional measurements, some from newer literature and some measurements which were not previously fit due to their larger measured uncertainties, has improved the molecular parameters and accuracy of the predicted spectral frequencies. The limits in maximum rotational level and frequency for the predicted spectra were based on the extent of the measured data and are as follows:

$^{32}SO_2$ ground:	$J_{max}=60$	$\nu_{max}=650$ GHz
$^{32}SO_2$ $\nu_2=1$:	$J_{max}=60$	$\nu_{max}=600$ GHz
$^{33}SO_2$:	$J_{max}=40$	$\nu_{max}=300$ GHz
$^{34}SO_2$:	$J_{max}=50$	$\nu_{max}=350$ GHz.

These limits are believed to be ample to cover both the range in excitation expected for interstellar molecules and the spectral range over which astronomical observations will be conducted.

The results of the weighted least-squares fitting and statistical analyses of the rotational spectrum of the various isotopic species of sulfur dioxide are given in Tables 3 to 6. For each of these tables the first column contains the upper state and lower state quantum numbers in the form $J(K_-,K_+)$ for an asymmetric rotor. For $^{33}SO_2$ in Table 5 the hyperfine quantum numbers, F, are also given. The quantum numbers are followed by the observed line frequency and, in parentheses, the experimentally estimated uncertainty in MHz. References to the laboratory measurements are shown in the last column of the table. The third column contains the calculated frequency and estimated uncertainty in MHz. These calculated uncertainties,

representing 95 percent confidence levels, are twice the standard deviation obtained from the least-squares analysis. The line strengths for the rotational transitions are shown in column four. The Einstein A values are given in the form -log A in the fifth column. The rotational energy of the lower state is given in column six in units of cm^{-1} rounded to three figures after the decimal. The energy is relative to the 0_{00} state for each species. For the $v_2=1$ state of $^{32}SO_2$ the 0_{00} state lies at 517.8 cm^{-1} above the same rotational level of the ground state. Also note that only b-type transitions occur for these species and the fact that only rotational levels with K_-K_+ values which are even-odd or odd-even integers exist. For all species, the line strengths have been calculated for all the calculated transitions. The line strengths, denoted ${}^xS(J'_{K'_-,K'_+}, J''_{K''_-,K''_+})$, are defined for all molecules treated in this review as:

$$ {}^xS(J'_{K'_-,K'_-}, J''_{K''_-,K''_+}) = \frac{(2J'+1)|\mu_{J'-J''}|^2}{\mu_x^2}, \quad (1) $$

where the superscript x refers to one of the principal axes of the molecule ($x = a$, b, or c), $|\mu_{J'-J''}|$ is the dipole moment matrix element connecting the upper $J'_{K'_-,K'_+}$ and lower $J''_{K''_-,K''_+}$ rotational levels involved in the transition, and μ_x is the magnitude of the component of μ along the x axis. Thus, the line strength as defined is independent of the absolute magnitude of the dipole moment. The line strength may be related to the Einstein coefficient, A, in the following manner. The probability, $A(J'_{K'_-,K'_+}, J''_{K''_-,K''_+})$, of a spontaneous transition in one second from the higher state, $J'_{K'_-,K'_+}$, to the lower state, $J''_{K''_-,K''_+}$, is

$$ A(J'_{K'_-,K'_+}, J''_{K''_-,K''_+}) = \frac{1.1639\times10^{-20}\nu^3\mu_x^2}{2J'+1} {}^xS(J'_{K'_-,K'_+}, J''_{K''_-,K''_+}), \quad (2) $$

where ν is the transition frequency in MHz and μ_x the electric dipole component as defined above in Debye units.

2.3. List of Symbols and Conversion Factors

a. Symbols

A,B,C	Rotational constants (MHz). $A \geqslant B \geqslant C$ ($A = h/8\pi^2 I_a$, etc.).
τ	Quartic centrifugal distortion constant (MHz).
H_K, h_K, h_{JK}	Sextic centrifugal distortion constant (MHz).
a,b,c	Principal axes corresponding to A, B, and C, respectively.
$\mu_{a,b,c}$	Components of the dipole moment along the principal axes (Debye).
D	Abbreviation for Debye units ($1D = 10^{-18}$ electrostatic units of charge x centimeters, or $1D = 3.33564\times10^{30}$ coulomb-meter).
eQq_{aa},.../ χ_{aa},...	Nuclear electric quadrupole coupling constant along indicated principal axis (MHz).
F	Total angular momentum quantum number which includes the nucleus with largest χ or eQq
J	Total rotational angular momentum quantum number.
K_-	Projection of J on the symmetry axis in the limiting prolate symmetric top.
K_+	Projection of J on the symmetry axis in the limiting oblate symmetric top.
(...)	Parentheses in the numerical listings contain measured or estimated uncertainties. These should be interpreted as: $26756.35(5) = 26756.35 \pm 0.05$ MHz.

b. Useful Conversion Factors

The following fundamental constants and conversion factors may be useful in converting values presented here to other units:

$A \cdot I_a$	$= 5.0537905(85)\times10^5$ MHz·u·Å^2,
h	$= 6.626176(36)\times10^{-34}$ J·s,
c	$= 2.99792458(1)\times10^8$ m·s^{-1},
1 cm^{-1}	$= 1.986478(11)\times10^{-23}$ J,
	$= 11.96266$ J·mol^{-1},
1 u	$= 1.6605655(86)\times10^{-27}$ kg,
1 Å	$= 10^{-10}$ m.

2.4. References to Sections 1 and 2

[1] F. J. Lovas, J. Phys. Chem. Ref. Data 7, 1445 (1978).
[2] J. K. G. Watson, J. Chem. Phys. 46, 1935 (1967).
[3] W. H. Kirchhoff, J. Mol. Spectrosc. 41, 333 (1972).

3. Sulfur Dioxide Spectral Tables

TABLE 1. Rotational, centrifugal distortion, and other derived constants for $^{32}S^{16}O_2$ in its vibrational ground state and $\nu_2=1$ excited vibrational state

Parameter	$^{32}S^{16}O_2$ ground state value (MHz)	$^{32}S^{16}O_2$ $\nu_2=1$ value (MHz)
Fitted constants		
A''	60778.5612(17)[a]	61954.7948(140)[a]
B''	10317.91538(23)	10320.2165(25)
C''	8799.65360(25)	8783.80612(222)
τ_1	0.3882253(1140)	0.4092961(2041)
τ_2	0.03155327(1654)	0.0335917(318)
τ_3[b]	0.7282(4)	0.6998(7)
τ_{aaaa}	-9.917103(212)	-11.02578(83)
τ_{bbbb}	-0.04005655(708)	-0.0401371(146)
τ_{cccc}	-0.01283487(565)	-0.0127422(105)
H_J	$1.3593(906)\times10^{-8}$	0
H_{JK}	$4.169(3357)\times10^{-8}$	0
H_{KJ}	$-1.84598(94)\times10^{-5}$	$-2.2418(781)\times10^{-5}$
H_K	$3.55723(52)\times10^{-4}$	$4.4981(849)\times10^{-4}$
h_J	$0.99199(2320)\times10^{-8}$	$1.215(18)\times10^{-8}$
h_{JK}	$0.50801(2744)\times10^{-6}$	0
h_K	$0.9582(1100)\times10^{-5}$	$1.609(157)\times10^{-5}$
σ[c]	1.32	1.05
Derived constants		
A'	60778.5511(17)	61954.7850(140)
B'	10317.96567(23)	10320.2714(25)
C'	8799.80750(25)	8783.96562(219)
τ_{bbcc}	-0.02165(57)	-0.019580(13)
τ_{ccaa}	0.10058(29)	0.10988(11)
τ_{aabb}	0.30780(96)	0.31899(14)
Dipole moment [79A]		
μ_b	1.63305(4) D	1.62614(4) D

[a]Uncertainties in parentheses are one standard deviation and refer to the last corresponding significant figures.

[b]Value set by planarity conditions. See discussion by Kirchhoff (Ref. 3 in Sec. 2.2).

[c]Standard deviation of the weighted least-squares fit, a dimensionless unit.

TABLE 2. Rotational and centrifugal distortion constants for $^{33}S^{16}O_2$ and $^{34}S^{16}O_2$ in their ground vibration state

Parameter	$^{33}S^{16}O_2$ value (MHz)	$^{34}S^{16}O_2$ value (MHz)
Fitted constants		
A''	59856.4880(482)[a]	58991.2059(164)[a]
B''	10318.1387(94)	10318.3593(30)
C''	8780.09300(831)	8761.25964(266)
τ_1	0.378815(9686)	0.3676091(7245)
τ_2	0.0311714(14554)	0.0303664(1111)
τ_3[b]	0.681(34)	0.6524(24)
τ_{aaaa}	-9.62615(1438)	-9.339628(1073)
τ_{bbbb}	-0.0398869(6017)	-0.0400444(455)
τ_{cccc}	-0.012818(370)	-0.012523(36)
H_J	$-0.61776(35837)\times10^{-6}$	$0.1610(1020)\times10^{-7}$
H_{JK}	$-0.16345(9014)\times10^{-4}$	$0.1370(4881)\times10^{-6}$
H_{KJ}	$0.52023(32715)\times10^{-4}$	$-0.20188(2244)\times10^{-4}$
H_K	$-0.1500(2357)\times10^{-3}$	$0.35540(1468)\times10^{-5}$
h_J	$-0.1406(769)\times10^{-6}$	$0.410(652)\times10^{-8}$
h_{JK}	$-0.5839(4285)\times10^{-5}$	$0.5425(4190)\times10^{-6}$
h_K	$0.1553(948)\times10^{-3}$	$0.8159(12728)\times10^{-4}$
σ[c]	1.09	0.86
Derived constants		
A'	59856.478(48)	58991.196(16)
B'	10318.186(9)	10 318.404(3)
C'	8780.245(9)	8761.408(3)
τ_{bbcc}	-0.019806(516)	-0.019719(40)
τ_{ccaa}	0.09539(237)	0.09024(26)
τ_{aabb}	0.30323(685)	0.29709(49)
Nuclear quadrupole coupling constants		
χ_{aa}	-1.521(95)	
χ_{bb}	25.785(56)	
χ_{cc}	-24.264(105)	

[a]Uncertainties in parentheses are one standard deviation and refer to the last corresponding significant figures.

[b]Value set by planarity conditions. See discussion by Kirchhoff (Ref. 3 in Sec. 2.2).

[c]Standard deviation of the weighted least-squares fit, a dimensionless unit.

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz)

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency		-log(A)	S_{ij}	Energy lower st.	Reference
39(7,33) - 38(8,30)		521.469(	19)	12.4841	6.012	583.167	
27(2,26) - 26(3,23)		2838.932(	42)	10.9300	0.911	243.803	
43(9,35) - 44(8,36)		3045.761(	22)	10.1626	6.780	743.034	
19(3,17) - 18(4,14)		4027.133(	11)	9.8295	2.849	136.782	
38(4,34) - 39(3,37)		4195.705(	61)	10.4938	1.068	509.589	
11(3, 9) - 12(2,10)	4546.018(20)	4546.014(	8)	9.6241	1.874	57.398	[73A]
60(11,49) - 59(12,48)		5189.705(	88)	9.4854	9.282	1376.490	
29(5,25) - 28(6,22)		6837.456(	13)	9.1245	4.466	321.230	
34(6,28) - 33(7,27)		6848.456(	20)	9.1205	5.247	442.520	
15(2,14) - 14(3,11)	7169.450(100)	7169.636(	12)	9.1266	2.025	82.698	[70A]
48(10,38) - 49(9,41)		7503.464(	30)	8.9894	7.547	922.154	
12(2,10) - 13(1,13)	8420.300(200)	8420.260(	21)	9.2366	0.782	57.117	[68A]
27(6,22) - 28(5,23)	8911.000(200)	8911.097(	17)	8.7666	4.285	302.957	[68A]
55(10,46) - 54(11,43)	9240.700(100)	9240.780(	44)	8.7289	8.513	1155.537	[68A]
18(3,15) - 17(4,14)	9403.200(200)	9403.245(	12)	8.7112	2.788	125.184	[68A]
53(11,43) - 54(10,44)	11472.300(100)	11472.275(	39)	8.4366	8.315	1120.557	[68A]
10(2, 8) - 11(1,11)	11788.841(20)	11788.867(	15)	8.6570	0.910	41.953	[73A]
22(5,17) - 23(4,20)	12132.400(200)	12132.433(	11)	8.3661	3.493	204.139	[68A]
1(1, 1) - 2(0, 2)	12256.5835(6)	12256.584(	1)	8.0021	0.522	1.912	[76A]
50(9,41) - 49(10,40)	13599.500(100)	13599.539(	28)	8.2239	7.745	953.813	[62A]
14(2,12) - 15(1,15)	14587.697(20)	14587.742(	28)	8.6851	0.621	74.663	[73A]
58(12,46) - 59(11,49)	15470.400(100)	15470.081(	78)	8.0472	9.083	1338.195	[68A]
32(7,25) - 33(6,28)	16681.030(100)	16680.990(	15)	7.9513	5.046	420.794	[64B]
45(8,38) - 44(9,35)	17539.940(100)	17539.898(	25)	7.8919	6.976	771.354	[64B]
37(8,30) - 38(7,31)	19637.100(100)	19637.064(	20)	7.7392	5.815	558.138	[64B]
12(3, 9) - 13(2,12)	20335.396(20)	20335.398(	8)	7.7191	1.829	64.627	[73A]
24(4,20) - 23(5,19)	22482.548(20)	22482.589(	17)	7.5716	3.725	219.286	[73A]
40(7,33) - 39(8,32)	23034.821(20)	23034.787(	21)	7.5366	6.209	608.186	[73A]
5(2, 4) - 6(1, 5)	23414.253(20)	23414.254(	4)	7.4624	0.952	15.614	[73A]
21(5,17) - 22(4,18)	24039.641(20)	24039.629(	13)	7.4773	3.322	189.617	[73A]
8(2, 6) - 9(1, 9)	24083.455(20)	24083.474(	10)	7.6224	0.935	29.185	[73A]
42(9,33) - 43(8,36)	24319.556(20)	24319.660(	23)	7.4611	6.380	714.755	[73A]
49(4,46) - 48(5,43)	24915.600(100)	24915.572(	87)	8.1675	1.409	807.314	[68A]
35(6,30) - 34(7,27)	25049.430(20)	25049.496(	17)	7.4280	5.433	464.345	[73A]
8(1, 7) - 7(2, 6)	25392.776(20)	25392.819(	4)	7.3178	1.609	24.671	[51A]
25(4,22) - 24(5,19)	26776.574(20)	26776.654(	13)	7.3472	3.848	234.726	[73A]
25(2,24) - 24(3,21)	27932.200(200)	27932.457(	37)	7.8140	1.157	210.144	[68A]
47(10,38) - 48(9,39)	28179.200(50)	28179.329(	27)	7.2694	7.347	890.700	[62B]
17(2,16) - 16(3,13)	28858.037(20)	28858.057(	17)	7.3549	2.072	102.750	[73A]
4(0, 4) - 3(1, 3)	29321.3304(4)	29321.330(	1)	6.8388	1.667	5.382	[76A]
16(2,14) - 17(1,17)	30205.520(100)	30205.522(	36)	7.9103	0.474	94.581	[64B]
56(10,46) - 55(11,45)	30218.840(100)	30218.830(	48)	7.1812	8.710	1190.779	[65A]
28(3,25) - 29(2,28)	31089.920(100)	31089.881(	49)	7.9287	0.720	279.086	[64B]
16(4,12) - 17(3,15)	31922.210(30)	31922.266(	9)	7.1145	2.511	113.244	[63A]
52(11,41) - 53(10,44)	32195.450(100)	32195.414(	37)	7.0960	8.114	1085.913	[64B]
50(5,45) - 51(4,48)	32829.930(100)	32830.076(	154)	7.8834	1.197	871.481	[65A]
26(6,20) - 27(5,23)	34097.720(30)	34097.725(	13)	7.0238	4.077	284.803	[63A]
51(9,43) - 50(10,40)	34393.550(100)	34393.501(	35)	7.0122	7.940	985.869	[64B]
57(12,46) - 58(11,47)	36003.540(100)	36003.305(	70)	6.9503	8.881	1300.373	[64B]
31(7,25) - 32(6,26)	36065.230(30)	36065.268(	19)	6.9505	4.848	399.622	[63A]
30(5,25) - 29(6,24)	36338.050(30)	36338.144(	22)	6.9426	4.675	339.835	[63A]
21(3,19) - 20(4,16)	37351.800(100)	37351.869(	15)	6.9322	3.107	161.877	[64B]
15(4,12) - 16(3,13)	38518.225(20)	38518.231(	9)	6.8695	2.360	102.750	[73A]
37(3,35) - 36(4,32)	38909.700(100)	38909.675(	53)	7.4949	1.313	460.196	[64B]
46(8,38) - 45(9,37)	39446.990(100)	39446.913(	23)	6.8332	7.171	800.217	[64B]
36(8,28) - 37(7,31)	41177.500(100)	41177.431(	20)	6.7782	5.612	533.695	[68A]

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
41(7,35) - 40(8,32)	42680.090(100)	42680.061(23)	6.7306	6.397	633.858	[64B]
19(2,18) - 18(3,15)	43016.280(100)	43016.325(23)	6.9050	1.964	125.498	[64B]
23(2,22) - 22(3,19)	43178.140(100)	43178.221(33)	7.1147	1.445	179.191	[64B]
6(2, 4) - 7(1, 7)	44052.860(20)	44052.873(6)	6.7827	0.808	18.825	[73A]
41(9,33) - 42(8,34)	44875.860(30)	44875.888(22)	6.6662	6.378	687.145	[64C]
31(5,27) - 30(6,24)	47660.600(50)	47660.704(17)	6.5891	4.830	359.120	[68A]
14(2,12) - 13(3,11)	47913.420(20)	47913.440(10)	6.5498	2.395	73.551	[73A]
21(2,20) - 20(3,17)	48120.440(30)	48120.485(29)	6.8554	1.735	150.973	[64C]
46(10,36) - 47(9,39)	48958.180(30)	48958.202(27)	6.5529	7.144	859.888	[64C]
57(10,48) - 56(11,45)	51086.100(100)	51086.329(56)	6.4949	8.904	1226.665	[68A]
36(6,30) - 35(7,29)	51185.220(60)	51185.253(26)	6.4934	5.631	486.808	[64C]
20(5,15) - 21(4,18)	51736.590(30)	51736.659(11)	6.4877	3.103	175.236	[64C]
10(3, 7) - 11(2,10)	52051.710(30)	52051.767(7)	6.5000	1.517	48.802	[64C]
25(6,20) - 26(5,21)	52188.480(60)	52188.489(16)	6.4742	3.878	267.525	[64C]
51(11,41) - 52(10,42)	52744.000(100)	52744.088(34)	6.4558	7.911	1051.919	[68A]
9(3, 7) - 10(2, 8)	53015.400(200)	53015.252(7)	6.4685	1.397	42.347	[68A]
2(1, 1) - 2(0, 2)	53528.800(50)	53528.862(3)	5.6299	2.463	1.912	[70A]
40(4,36) - 41(3,39)	54138.800(300)	54139.086(84)	7.2679	0.887	560.038	[68A]
18(2,16) - 19(1,19)	54633.400(200)	54633.556(46)	7.3089	0.359	116.862	[68A]
52(9,43) - 51(10,42)	55932.000(100)	55932.116(33)	6.3764	8.133	1018.570	[68A]
56(12,44) - 57(11,47)	56481.050(50)	56481.153(64)	6.3665	8.678	1263.196	[70A]
59(5,55) - 58(6,52)	56572.000(50)	56572.038(130)	7.0855	1.749	1172.622	[70A]
30(7,23) - 31(6,26)	58042.410(200)	58042.619(18)	6.3354	4.642	379.014	[65A]
4(1, 3) - 4(0, 4)	59224.840(100)	59224.868(3)	5.5218	1.198	6.360	[65A]
47(8,40) - 46(9,37)	59883.500(50)	59883.449(31)	6.2872	7.360	829.730	[70A]
35(8,28) - 36(7,29)	61489.850(50)	61489.831(22)	6.2598	5.408	509.938	[70A]
20(3,17) - 19(4,16)	61636.160(50)	61636.230(17)	6.2433	3.221	148.917	[70A]
27(4,24) - 26(5,21)	64277.100(40)	64277.275(19)	6.2063	4.149	267.525	[63A]
40(9,31) - 41(8,34)	65714.090(40)	65714.054(23)	6.1729	6.174	660.172	[63A]
23(3,21) - 22(4,18)	66724.870(40)	66724.962(21)	6.1950	3.253	189.617	[63A]
42(7,35) - 41(8,34)	66761.150(50)	66761.047(27)	6.1452	6.589	660.172	[70A]
37(6,32) - 36(7,29)	67011.290(40)	67011.326(24)	6.1413	5.801	509.938	[63A]
19(5,15) - 20(4,16)	67848.650(50)	67848.657(13)	6.1413	2.906	161.877	[70A]
6(1, 5) - 6(0, 6)	68972.170(50)	68972.154(4)	5.3623	5.542	13.313	[70A]
14(4,10) - 15(3,13)	69464.090(50)	69464.094(9)	6.1187	2.121	92.118	[70A]
45(10,36) - 46(9,37)	69480.430(50)	69480.400(26)	6.1000	6.940	829.730	[70A]
1(1, 1) - 0(0, 0)	69575.910(20)	69575.927(3)	5.4578	1.000	0.000	[73A]
3(2, 2) - 4(1, 3)	69653.570(50)	69653.586(5)	6.2166	0.405	8.336	[70A]
4(2, 2) - 5(1, 5)	70134.368(20)	70134.377(5)	6.2018	0.528	10.886	[73A]
58(10,48) - 57(11,47)	72383.710(50)	72383.832(66)	6.0389	9.096	1263.196	[70A]
30(3,27) - 31(2,30)	72437.260(40)	72437.211(63)	6.9507	0.579	316.632	[63A]
26(4,22) - 25(5,21)	72668.030(50)	72668.123(24)	6.0339	4.115	250.746	[70A]
6(0, 6) - 5(1, 5)	72758.240(50)	72758.242(2)	5.5578	3.010	10.886	[70A]
50(11,39) - 51(10,42)	73255.220(50)	73255.177(34)	6.0308	7.706	1018.570	[70A]
35(3,33) - 34(4,30)	73430.420(50)	73430.436(50)	6.5501	1.628	413.312	[70A]
24(6,18) - 25(5,21)	74866.510(50)	74866.514(16)	6.0110	3.668	250.746	[70A]
10(1, 9) - 9(2, 8)	76412.162(20)	76412.170(5)	5.7999	2.404	35.478	[73A]
47(4,44) - 46(5,41)	76540.020(50)	76539.861(82)	6.6062	1.692	744.603	[70A]
53(9,45) - 52(10,42)	76762.280(50)	76762.195(44)	5.9621	8.322	1051.919	[70A]
55(12,44) - 56(11,45)	76860.550(50)	76860.507(61)	5.9679	8.473	1226.665	[70A]
29(7,23) - 30(6,24)	77926.720(50)	77926.702(21)	5.9569	4.436	359.120	[70A]
34(8,26) - 35(7,29)		82409.504(23)	5.8829	5.201	486.808	
48(8,40) - 47(9,39)		82752.775(29)	5.8638	7.549	859.888	
13(4,10) - 14(3,11)	82951.980(50)	82951.970(10)	5.8980	1.927	82.698	[80A]
8(1, 7) - 8(0, 8)	83687.984(50)	83688.086(7)	5.1659	6.177	22.727	[80A]
32(5,27) - 31(6,26)		84320.936(32)	5.8400	5.048	439.014	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
43(7,37) - 42(8,34)		85246.979(32)	5.8253	6.766	687.145	
39(9,31) - 40(8,32)		86153.709(25)	5.8241	5.967	633.858	
8(3, 5) - 9(2, 8)	86639.040(100)	86639.108(7)	5.8720	1.131	35.478	[80A]
20(2,18) - 21(1,21)		86828.882(59)	6.8644	0.276	141.501	
33(5,29) - 32(6,26)		87926.389(25)	5.7895	5.156	399.622	
44(10,34) - 45(9,37)		90005.068(28)	5.7663	6.733	800.217	
25(3,23) - 24(4,20)		90548.251(28)	5.8323	3.256	220.036	
18(5,13) - 19(4,16)	91550.405(50)	91550.470(13)	5.7619	2.688	148.917	[78A]
59(10,50) - 58(11,47)		93373.163(79)	5.7056	9.285	1300.373	
49(11,39) - 50(10,40)	93641.850(50)	93641.770(34)	5.7141	7.499	985.869	[78A]
23(6,18) - 24(5,19)	94064.660(50)	94064.719(19)	5.7209	3.459	234.726	[78A]
52(5,47) - 53(4,50)		94478.719(314)	6.5842	1.043	937.156	
54(12,42) - 55(11,45)		97177.295(61)	5.6652	8.266	1190.779	
38(6,32) - 37(7,31)		97466.372(37)	5.6500	5.998	533.695	
7(3, 5) - 8(2, 6)		97702.359(8)	5.7412	0.940	29.988	
33(3,31) - 32(4,28)		97994.139(48)	6.0581	2.007	369.135	
54(9,45) - 53(10,44)		98917.697(47)	5.6300	8.509	1085.913	
28(7,21) - 29(6,24)		98976.284(22)	5.6515	4.225	339.835	
29(4,26) - 28(5,23)		99392.645(27)	5.6461	4.373	302.957	
59(13,47) - 60(12,48)		100563.104(146)	5.6199	9.034	1414.913	
2(2, 0) - 3(1, 3)	100878.090(50)	100878.113(6)	5.9888	0.161	5.382	[70A]
33(8,26) - 34(7,27)	102690.050(80)	102690.022(26)	5.6012	4.992	464.345	[70A]
49(8,42) - 48(9,39)	102707.240(80)	102707.136(42)	5.5809	7.729	890.700	[70A]
3(1, 3) - 2(0, 2)	104029.420(80)	104029.416(5)	4.9974	2.015	1.912	[70A]
16(2,14) - 15(3,13)	104033.560(80)	104033.616(14)	5.4987	2.995	92.118	[70A]
10(1, 9) - 10(0,10)	104239.280(80)	104239.293(10)	4.9501	6.700	34.549	[70A]
38(9,29) - 39(8,32)	106674.820(80)	106674.752(27)	5.5500	5.758	608.186	[70A]
27(3,25) - 26(4,22)	107060.190(80)	107060.323(35)	5.6680	3.102	253.170	[70A]
12(4, 8) - 13(3,11)	107843.460(80)	107843.508(11)	5.5770	1.701	73.551	[70A]
42(4,38) - 43(3,41)	108915.460(80)	108915.346(138)	6.4479	0.755	612.834	[70A]
39(6,34) - 38(7,31)	108955.910(80)	108955.990(35)	5.5058	6.141	558.138	[70A]
17(5,13) - 18(4,14)	109757.600(80)	109757.633(15)	5.5368	2.477	136.782	[70A]
43(10,34) - 44(9,35)	110363.800(80)	110363.759(29)	5.5045	6.525	771.354	[70A]
31(3,29) - 30(4,26)	111755.030(80)	111755.106(46)	5.7791	2.418	327.708	[70A]
44(7,37) - 43(8,36)	111875.540(80)	111875.440(40)	5.4691	6.954	714.755	[70A]
48(11,37) - 49(10,40)	113970.870(80)	113970.841(38)	5.4615	7.291	953.813	[70A]
29(3,27) - 28(4,24)	114565.350(80)	114565.476(41)	5.6538	2.806	289.053	[70A]
60(10,50) - 59(11,49)	115090.630(80)	115090.932(102)	5.4316	9.471	1338.195	[70A]
22(6,16) - 23(5,19)	115317.580(80)	115317.585(20)	5.4644	3.245	219.286	[70A]
57(5,53) - 56(6,50)		115904.904(174)	6.0632	2.062	1096.786	
8(0, 8) - 7(1, 7)	116980.440(80)	116980.450(5)	4.8713	4.601	18.825	[70A]
53(12,42) - 54(11,43)	117412.570(80)	117412.713(65)	5.4219	8.058	1155.537	[70A]
22(3,19) - 21(4,18)	118577.420(80)	118577.505(25)	5.3728	3.685	175.236	[70A]
27(7,21) - 28(6,22)	118994.210(80)	118994.233(26)	5.4183	4.014	321.230	[70A]
32(3,29) - 33(2,32)	119483.080(80)	119482.926(88)	6.4090	0.479	356.530	[70A]
55(9,47) - 54(10,44)		119621.838(62)	5.3811	8.691	1120.557	
45(4,42) - 44(5,39)	120023.400(80)	120023.410(86)	5.9162	2.058	684.519	[70A]
58(13,45) - 59(12,48)		120713.251(144)	5.3848	8.826	1376.490	
6(3, 3) - 7(2, 6)	123057.690(80)	123057.714(9)	5.4999	0.711	24.671	[70A]
32(8,24) - 33(7,27)	123194.700(80)	123194.644(29)	5.3697	4.781	442.520	[70A]
11(4, 8) - 12(3, 9)	124864.740(80)	124864.805(13)	5.4076	1.489	65.306	[70A]
22(2,20) - 23(1,23)	125427.130(80)	125427.147(78)	6.5274	0.218	168.492	[70A]
37(9,29) - 38(8,30)	126962.460(80)	126962.421(31)	5.3280	5.548	583.167	[70A]
35(5,31) - 34(6,28)	126980.700(80)	126980.849(37)	5.3133	5.431	442.748	[70A]
50(8,42) - 49(9,41)	127081.960(80)	127081.753(46)	5.3020	7.912	922.154	[70A]
28(4,24) - 27(5,23)	127428.230(80)	127428.307(35)	5.2946	4.503	284.803	[70A]

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
45(7,39) - 44(8,36)	128103.810(80)	128103.807(47)	5.2924	7.114	743.034	[70A]
12(2,10) - 12(1,11)	128605.130(80)	128605.091(18)	4.5825	9.902	53.108	[70A]
12(1,11) - 11(2,10)	129105.830(80)	129105.799(9)	5.0444	3.379	48.802	[70A]
10(2, 8) - 10(1, 9)	129514.810(80)	129514.785(14)	4.6017	7.791	38.027	[70A]
42(10,32) - 43(9,35)	130680.010(80)	130679.878(33)	5.2885	6.315	743.136	[70A]
31(4,28) - 30(5,25)	130859.400(80)	130859.586(37)	5.3046	4.492	341.047	[70A]
12(1,11) - 12(0,12)	131014.860(80)	131014.837(15)	4.7316	6.645	48.738	[70A]
16(5,11) - 17(4,14)	131274.930(80)	131274.914(17)	5.3182	2.259	125.184	[70A]
14(2,12) - 14(1,13)	132744.860(80)	132744.809(22)	4.5327	11.715	70.722	[70A]
8(2, 6) - 8(1, 7)	134004.860(80)	134004.805(11)	4.6019	5.692	25.518	[70A]
47(11,37) - 48(10,38)	134203.820(80)	134203.807(43)	5.2523	7.081	922.404	[70A]
21(6,16) - 22(5,17)	134943.300(80)	134943.336(23)	5.2696	3.030	204.543	[70A]
5(1, 5) - 4(0, 4)	135696.020(80)	135696.012(8)	4.6559	3.132	6.360	[70A]
34(5,29) - 33(6,28)	135963.000(80)	135963.113(46)	5.2139	5.405	420.794	[70A]
52(12,40) - 53(11,43)	137585.050(80)	137585.133(73)	5.2186	7.849	1120.940	[70A]
5(3, 3) - 6(2, 4)	139355.060(80)	139355.061(11)	5.4140	0.505	20.294	[70A]
26(7,19) - 27(6,22)	139474.540(80)	139474.504(28)	5.2192	3.799	303.254	[70A]
6(2, 4) - 6(1, 5)	140306.170(80)	140306.164(9)	4.5973	3.833	15.614	[70A]
57(13,45) - 58(12,46)		140800.725(147)	5.1873	8.617	1338.711	
56(9,47) - 55(10,46)	142690.180(80)	142689.994(80)	5.1501	8.873	1155.845	[70A]
16(2,14) - 16(1,15)	143057.110(80)	143057.059(28)	4.4471	12.972	90.817	[70A]
31(8,24) - 32(7,25)	143357.800(80)	143357.770(33)	5.1784	4.568	421.351	[70A]
51(8,44) - 50(9,41)	145970.290(80)	145970.119(61)	5.1208	8.081	954.267	[70A]
40(6,34) - 39(7,33)	146393.720(80)	146393.703(55)	5.1176	6.345	583.184	[70A]
10(4, 6) - 11(3, 9)	146550.080(80)	146550.098(14)	5.2294	1.268	57.549	[70A]
4(2, 2) - 4(1, 3)	146605.520(80)	146605.521(8)	4.6074	2.272	8.336	[70A]
36(9,27) - 37(8,30)	147239.280(80)	147239.184(35)	5.1401	5.335	558.793	[70A]
15(5,11) - 16(4,12)	150381.100(80)	150381.139(20)	5.1579	2.042	114.309	[70A]
41(6,36) - 40(7,33)	150486.920(80)	150487.027(51)	5.0855	6.445	608.954	[70A]
41(10,32) - 42(9,33)	150878.810(80)	150878.693(39)	5.1057	6.103	715.566	[70A]
2(2, 0) - 2(1, 1)	151378.630(80)	151378.668(8)	4.7270	0.871	3.697	[70A]
43(4,40) - 42(5,37)	153677.140(80)	153677.154(84)	5.4893	2.504	627.131	[70A]
46(11,35) - 47(10,38)	154373.340(80)	154373.303(51)	5.0738	6.870	891.640	[70A]
20(6,14) - 21(5,17)	155389.620(80)	155389.678(26)	5.0974	2.813	190.419	[70A]
33(4,30) - 32(5,27)		157135.428(47)	5.0946	4.474	381.827	
51(12,40) - 52(11,41)		157687.469(83)	5.0444	7.638	1086.987	
54(5,49) - 55(4,52)		157769.943(582)	5.9818	0.931	1005.164	
3(2, 2) - 3(1, 3)	158199.740(80)	158199.783(8)	4.5965	1.442	5.382	[70A]
46(7,39) - 45(8,38)	158845.080(80)	158844.924(62)	5.0104	7.300	771.939	[70A]
25(7,19) - 26(6,20)	159447.960(80)	159447.945(32)	5.0535	3.584	285.940	[70A]
18(2,16) - 18(1,17)	160342.990(80)	160342.957(33)	4.3287	13.566	113.336	[70A]
4(3, 1) - 5(2, 4)	160543.060(80)	160543.057(12)	5.3644	0.303	16.395	[70A]
10(0,10) - 9(1, 9)	160827.880(80)	160827.844(9)	4.4030	6.430	29.185	[70A]
56(13,43) - 57(12,46)		160831.633(155)	5.0172	8.406	1301.574	
57(9,49) - 56(10,46)		162973.201(95)	4.9761	9.046	1191.787	
18(2,16) - 17(3,15)		163119.438(21)	4.8683	3.719	113.244	
30(8,22) - 31(7,25)		163567.619(37)	5.0135	4.353	400.825	
14(1,13) - 14(0,14)		163605.531(20)	4.5221	6.412	65.264	
37(5,33) - 36(6,30)		163924.904(51)	4.9884	5.634	488.515	
9(4, 6) - 10(3, 7)		165123.695(17)	5.1114	1.052	50.538	
5(2, 4) - 5(1, 5)		165144.650(9)	4.5056	2.456	10.886	
7(1, 7) - 6(0, 6)		165225.443(11)	4.3836	4.430	13.313	
44(4,40) - 45(3,43)		166386.871(243)	5.9734	0.661	667.972	
35(9,27) - 36(8,28)		167367.232(40)	4.9789	5.122	535.068	
55(5,51) - 54(6,48)		167656.025(221)	5.4887	2.466	1023.549	
24(2,22) - 25(1,25)		168789.877(106)	6.2635	0.178	197.833	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency		-log(A)	S_{ij}	Energy lower st.	Reference
34(3,31) - 35(2,34)		170293.520(	132)	6.0424	0.408	398.776	
14(5, 9) - 15(4,12)		170754.621(	22)	5.0127	1.822	104.035	
40(10,30) - 41(9,33)		171017.926(	45)	4.9473	5.890	688.642	
47(7,41) - 46(8,38)		171036.662(	66)	4.9153	7.435	801.533	
52(8,44) - 51(9,43)		172728.283(	82)	4.9003	8.259	987.016	
45(11,35) - 46(10,36)		174463.822(	61)	4.9186	6.658	861.522	
19(6,14) - 20(5,15)		175101.383(	30)	4.9551	2.595	176.962	
7(2, 6) - 7(1, 7)		175275.717(	10)	4.4340	3.304	18.825	
41(4,38) - 40(5,35)		176295.963(	79)	5.2103	3.008	572.494	
35(4,32) - 34(5,29)		176466.428(	58)	4.9859	4.300	425.330	
50(12,38) - 51(11,41)		177729.555(	96)	4.8923	7.426	1053.678	
3(3, 1) - 4(2, 2)		179006.139(	13)	5.4915	0.127	13.226	
24(7,17) - 25(6,20)		179560.967(	37)	4.9085	3.366	269.265	
24(3,21) - 23(4,20)		180045.404(	35)	4.8072	4.217	204.139	
55(13,43) - 56(12,44)		180806.027(	168)	4.8681	8.194	1265.080	
14(1,13) - 13(2,12)	182705.890(100)	182706.072(	15)	4.5240	4.583	64.627	[74A]
29(8,22) - 30(7,23)	183582.710(100)	183582.672(	42)	4.8708	4.137	380.950	[74A]
20(2,18) - 20(1,19)	184969.800(100)	184969.824(	40)	4.1868	13.576	138.228	[74A]
8(4, 4) - 9(3, 7)	185278.600(100)	185278.404(	19)	5.0120	0.838	44.115	[74A]
37(4,34) - 36(5,31)		187055.566(	66)	4.9685	3.970	471.593	
39(4,36) - 38(5,33)		187338.059(	74)	5.0415	3.519	520.644	
30(4,26) - 29(5,25)	187370.330(100)	187370.367(	50)	4.7842	4.910	321.458	[74A]
58(9,49) - 57(10,48)		187432.732(	139)	4.7931	9.222	1228.369	
34(9,25) - 35(8,28)	187446.750(100)	187446.592(	46)	4.8375	4.906	511.989	[74A]
9(2, 8) - 9(1, 9)		188654.965(	13)	4.3576	4.002	29.185	
53(8,46) - 52(9,43)	189575.300(100)	189575.383(	89)	4.7793	8.412	1020.436	[74A]
13(5, 9) - 14(4,10)	190148.650(100)	190148.684(	26)	4.8969	1.604	94.435	[74A]
43(6,38) - 42(7,35)	191020.890(100)	191021.049(	71)	4.7782	6.701	662.399	[74A]
39(10,30) - 40(9,31)		191066.990(	53)	4.8081	5.675	662.364	
36(5,31) - 35(6,30)	192236.180(100)	192236.277(	65)	4.7600	5.753	465.180	[74A]
2(2, 0) - 1(1, 1)	192651.020(80)	192650.945(	10)	4.1832	1.478	2.321	[70A]
9(1, 9) - 8(0, 8)	193609.490(100)	193609.418(	15)	4.1510	5.957	22.727	[74A]
44(11,33) - 45(10,36)		194491.635(	72)	4.7815	6.444	832.048	
18(6,12) - 19(5,15)	195080.440(100)	195080.357(	34)	4.8298	2.376	164.140	[74A]
22(3,19) - 22(2,20)		195320.373(	61)	4.0420	17.661	172.676	
20(3,17) - 20(2,18)	197142.180(100)	197142.010(	56)	4.0488	15.407	144.397	[74A]
39(5,35) - 38(6,32)		197585.508(	68)	4.7597	5.739	536.946	
49(12,38) - 50(11,39)	197709.450(100)	197709.734(	112)	4.7575	7.213	1021.014	[74A]
42(6,36) - 41(7,35)	198847.860(100)	198847.826(	80)	4.7176	6.674	635.281	[74A]
23(7,17) - 24(6,18)		199415.895(	42)	4.7828	3.148	253.243	
24(3,21) - 24(2,22)	200287.530(80)	200287.396(	65)	4.0055	19.398	203.463	[70A]
54(13,41) - 55(12,44)		200727.869(	185)	4.7354	7.981	1229.229	
16(1,15) - 16(0,16)	200809.182(150)	200809.324(	27)	4.3283	6.165	84.118	[70A]
12(0,12) - 11(1,11)	203391.550(100)	203391.488(	15)	4.0553	8.428	41.953	[74A]
59(14,46) - 60(13,47)		203543.262(	326)	4.7155	8.750	1456.659	
28(8,20) - 29(7,23)	203570.150(100)	203570.035(	48)	4.7446	3.919	361.720	[74A]
18(3,15) - 18(2,16)		204246.715(	51)	4.0331	12.964	118.685	
7(4, 4) - 8(3, 5)	204384.300(100)	204384.262(	21)	4.9532	0.630	38.368	[74A]
11(2,10) - 11(1,11)	205300.570(100)	205300.525(	17)	4.2743	4.554	41.953	[74A]
59(9,51) - 58(10,48)		206786.918(	148)	4.6648	9.384	1265.611	
33(9,25) - 34(8,26)	207421.380(150)	207421.311(	54)	4.7124	4.690	489.557	[70A]
48(7,41) - 47(8,40)	208302.800(150)	208302.613(	101)	4.6565	7.626	831.728	[70A]
3(2, 2) - 2(1, 1)	208700.320(150)	208700.338(	11)	4.1727	1.667	3.697	[70A]
53(5,49) - 52(6,46)	209874.370(150)	209874.477(	227)	5.1001	2.964	952.988	[70A]
12(5, 7) - 13(4,10)	209936.050(150)	209936.135(	29)	4.7978	1.387	85.465	[70A]
38(10,28) - 39(9,31)	211053.100(80)	211052.936(	63)	4.6842	5.460	636.731	[70A]

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency		-log(A)	S_{ij}	Energy lower st.	Reference
26(3,23) - 26(2,24)	213068.400(150)	213068.438(	69)	3.9370	20.405	236.696	[70A]
49(7,43) - 48(8,40)	213703.000(150)	213703.006(	93)	4.6266	7.723	862.649	[70A]
43(11,33) - 44(10,34)	214451.890(80)	214451.799(	85)	4.6591	6.229	803.219	[70A]
16(3,13) - 16(2,14)	214689.380(150)	214689.359(	44)	4.0043	10.637	95.589	[70A]
17(6,12) - 18(5,13)	214728.330(150)	214728.363(	38)	4.7226	2.157	151.971	[70A]
26(2,24) - 27(1,27)	215094.540(150)	215094.182(	146)	6.0517	0.152	229.521	[70A]
22(2,20) - 22(1,21)		216643.328(	46)	4.0329	13.218	165.450	
48(12,36) - 49(11,39)		217633.770(	128)	4.6366	6.998	988.993	
22(7,15) - 23(6,18)		219276.000(	47)	4.6715	2.929	237.864	
54(8,46) - 53(9,45)	220102.680(150)	220102.285(	143)	4.5838	8.588	1054.480	[70A]
53(13,41) - 54(12,42)		220598.385(	206)	4.6162	7.768	1194.020	
56(5,51) - 57(4,54)		220618.348(	980)	5.6003	0.850	1075.502	
11(1,11) - 10(0,10)	221965.210(150)	221965.211(	21)	3.9439	7.711	34.549	[70A]
36(3,33) - 37(2,36)		222868.588(	208)	5.7723	0.359	443.365	
58(14,44) - 59(13,47)		223347.674(	343)	4.5979	8.537	1418.267	
27(8,20) - 28(7,21)	223434.470(150)	223434.428(	55)	4.6326	3.701	343.137	[70A]
6(4, 2) - 7(3, 5)		223883.643(	23)	4.9351	0.433	33.247	
20(2,18) - 19(3,17)		224264.900(	31)	4.4044	4.615	136.917	
46(4,42) - 47(3,45)		224472.883(	418)	5.6489	0.594	725.448	
13(2,12) - 13(1,13)		225153.688(	23)	4.1856	4.971	57.117	
14(3,11) - 14(2,12)		226300.006(	37)	3.9716	8.606	75.150	
41(5,37) - 40(6,34)		226508.510(	86)	4.6047	5.718	588.068	
32(9,23) - 33(8,26)		227335.637(	62)	4.6004	4.473	467.770	
11(5, 7) - 12(4, 8)		229347.727(	33)	4.7194	1.172	77.149	
45(6,40) - 44(7,37)		229749.883(	96)	4.5451	6.892	718.486	
37(10,28) - 38(9,29)		230965.061(	74)	4.5729	5.243	611.744	
55(8,48) - 54(9,45)		233345.373(	131)	4.5090	8.719	1089.213	
60(9,51) - 59(10,50)		233400.717(	234)	4.5065	9.554	1303.488	
28(3,25) - 28(2,26)		234187.121(	74)	3.8401	20.659	272.311	
42(11,31) - 43(10,34)		234352.982(	99)	4.5487	6.013	775.035	
16(6,10) - 17(5,13)		234421.674(	43)	4.6291	1.938	140.444	
4(2, 2) - 3(1, 3)		235151.719(	12)	4.1141	1.715	5.382	
16(1,15) - 15(2,14)		236216.725(	24)	4.1247	6.053	82.937	
12(3, 9) - 12(2,10)	237068.870(150)	237068.826(	28)	3.9427	6.898	57.398	[70A]
47(12,36) - 48(11,37)		237502.381(	147)	4.5273	6.783	957.615	
17(3,15) - 18(0,18)		238166.313(	48)	5.8362	0.122	105.299	
21(7,15) - 22(6,16)		238992.563(	54)	4.5734	2.710	223.132	
15(3,13) - 16(0,16)		239832.766(	40)	5.8546	0.101	84.118	
52(13,39) - 53(12,42)		240420.473(	229)	4.5081	7.553	1159.453	
18(1,17) - 18(0,18)		240942.793(	37)	4.1534	5.985	105.299	
51(5,47) - 50(6,44)		241044.820(	208)	4.8260	3.539	885.168	
5(2, 4) - 4(1, 3)		241615.795(	13)	4.0729	2.124	8.336	
19(3,17) - 20(0,20)		242997.719(	59)	5.8162	0.134	128.811	
5(4, 2) - 6(3, 3)		243087.723(	25)	4.9886	0.253	28.776	
57(14,44) - 58(13,45)		243108.803(	366)	4.4910	8.322	1380.517	
26(8,18) - 27(7,21)		243245.363(	63)	4.5323	3.483	325.199	
14(0,14) - 13(1,13)		244254.229(	24)	3.7855	10.506	57.117	
26(3,23) - 25(4,22)		245339.404(	48)	4.3762	4.862	235.619	
10(3, 7) - 10(2, 8)		245563.428(	21)	3.9241	5.441	42.347	
31(9,23) - 32(8,24)		247169.598(	72)	4.4996	4.254	446.629	
15(2,14) - 15(1,15)		248057.385(	31)	4.0939	5.271	74.663	
13(3,11) - 14(0,14)		248436.900(	33)	5.8830	0.074	65.264	
10(5, 5) - 11(4, 8)		248830.928(	36)	4.6597	0.961	69.471	
43(5,39) - 42(6,36)		248995.338(	105)	4.5152	5.545	641.914	
36(10,26) - 37(9,29)		250816.590(	86)	4.4721	5.026	587.402	
13(1,13) - 12(0,12)		251199.668(	28)	3.7556	9.633	48.738	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
8(3, 5) - 8(2, 6)		251210.600(16)	3.9217	4.137	29.988	
32(4,28) - 31(5,27)		252564.113(66)	4.3838	5.371	360.710	
21(3,19) - 22(0,22)		253753.311(76)	5.7880	0.138	154.658	
38(5,33) - 37(6,32)		253936.047(88)	4.3945	6.108	512.173	
15(6,10) - 16(5,11)		253956.662(49)	4.5493	1.721	129.563	
41(11,31) - 42(10,32)		254194.850(114)	4.4485	5.796	747.495	
6(3, 3) - 6(2, 4)		254280.557(14)	3.9445	2.894	20.294	
24(2,22) - 24(1,23)		254283.373(55)	3.8772	12.737	194.981	
4(3, 1) - 4(2, 2)		255553.328(14)	4.0323	1.613	13.226	
51(7,45) - 50(8,42)		255595.350(130)	4.3971	7.966	926.393	
44(6,38) - 43(7,37)		255818.387(118)	4.3893	6.988	689.988	
3(3, 1) - 3(2, 2)		255958.072(15)	4.1787	0.891	10.659	
5(3, 3) - 5(2, 4)		256246.969(14)	3.9692	2.261	16.395	
7(3, 5) - 7(2, 6)		257099.982(14)	3.9126	3.477	24.671	
46(12,34) - 47(11,37)		257319.402(167)	4.4277	6.567	926.881	
32(4,28) - 32(3,29)		258388.809(124)	3.6773	25.519	360.516	
20(7,13) - 21(6,16)		258667.002(61)	4.4862	2.491	209.045	
9(3, 7) - 9(2, 8)		258942.207(18)	3.8800	4.647	35.478	
30(4,26) - 30(3,27)		259599.475(109)	3.6835	23.277	319.048	
51(13,39) - 52(12,40)		260195.814(254)	4.4094	7.337	1125.529	
49(5,45) - 48(6,42)		260269.496(180)	4.6397	4.149	820.138	
50(7,43) - 49(8,42)		261062.504(163)	4.3628	7.931	894.126	
27(4,24) - 28(1,27)		261091.104(103)	5.5071	0.310	260.960	
11(3, 9) - 11(2,10)		262256.902(25)	3.8514	5.784	48.802	
4(4, 0) - 5(3, 3)		262334.043(27)	5.1995	0.101	24.943	
28(2,26) - 29(1,29)		262524.359(205)	5.8796	0.134	263.554	
56(14,42) - 57(13,45)		262828.590(394)	4.3931	8.107	1343.407	
25(8,18) - 26(7,19)		262969.660(72)	4.4423	3.263	307.907	
45(5,41) - 44(6,38)		263216.676(127)	4.4895	5.209	698.521	
30(3,27) - 30(2,28)		263544.090(82)	3.7227	20.330	310.258	
25(4,22) - 26(1,25)		263897.785(97)	5.5107	0.276	226.817	
11(3, 9) - 12(0,12)		264165.941(27)	5.9505	0.045	48.738	
29(4,26) - 30(1,29)		265461.395(114)	5.4904	0.328	297.418	
34(4,30) - 34(3,31)		265482.156(149)	3.6426	27.052	404.456	
47(6,42) - 46(7,39)		265608.500(127)	4.3684	6.994	777.237	
30(9,21) - 31(8,24)		266943.145(83)	4.4082	4.036	426.133	
47(5,43) - 46(6,40)		267428.527(151)	4.5296	4.728	757.923	
13(3,11) - 13(2,12)		267537.441(33)	3.8203	6.870	64.627	
28(4,24) - 28(3,25)		267719.828(101)	3.6662	20.638	280.123	
9(5, 5) - 10(4, 6)		268168.445(40)	4.6224	0.757	62.438	
56(8,48) - 55(9,47)		269761.922(238)	4.3190	8.897	1124.547	
23(3,21) - 24(0,24)		269786.211(99)	5.7504	0.137	182.843	
57(7,51) - 58(4,54)		270230.824(3840)	5.2503	1.054	1136.818	
35(10,26) - 36(9,27)		270605.301(99)	4.3804	4.808	563.704	
7(2, 6) - 6(1, 5)		271529.008(17)	3.9558	2.672	15.614	
55(7,49) - 56(4,52)		271691.563(3534)	5.2507	1.000	1063.899	
37(5,33) - 38(2,36)		271726.613(338)	5.3521	0.535	484.919	
14(6, 8) - 15(5,11)		273462.770(54)	4.4820	1.506	119.325	
17(2,16) - 17(1,17)		273752.938(40)	4.0015	5.477	94.581	
40(11,29) - 41(10,32)		273982.609(131)	4.3568	5.579	720.599	
47(6,42) - 48(3,45)		274077.445(1344)	5.2768	0.786	776.955	
35(5,31) - 36(2,34)		274521.906(280)	5.3513	0.492	437.827	
23(4,20) - 24(1,23)		274525.367(95)	5.5074	0.228	194.981	
15(3,13) - 15(2,14)		275240.164(43)	3.7839	7.878	82.937	
38(3,35) - 39(2,38)		275374.762(330)	5.5647	0.324	490.297	
31(4,28) - 32(1,31)		276254.469(131)	5.4594	0.334	336.198	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	$-\log(A)$	S_{ij}	Energy lower st.	Reference
45(6,40) - 46(3,43)		276303.164(1180)	5.2756	0.737	716.934	
39(5,35) - 40(2,38)		276558.891(403)	5.3338	0.558	534.312	
59(7,53) - 60(4,56)		276867.672(4148)	5.2229	1.080	1212.004	
57(8,50) - 56(9,47)	276992.840(200)	276992.844(192)	4.2875	8.994	1160.605	[70A]
45(12,34) - 46(11,35)	277085.960(200)	277086.512(189)	4.3364	6.350	896.789	[70A]
19(7,13) - 20(6,14)	278250.970(200)	278251.012(68)	4.4093	2.273	195.602	[70A]
49(6,44) - 50(3,47)		279769.059(1510)	5.2545	0.810	839.259	
50(13,37) - 51(12,40)		279926.766(281)	4.3187	7.121	1092.247	
26(4,22) - 26(3,23)	280807.280(200)	280807.215(97)	3.6329	17.956	243.803	[70A]
58(5,53) - 59(4,56)		281362.969(1534)	5.3307	0.790	1148.168	
48(4,44) - 49(3,47)		281401.660(685)	5.4101	0.545	785.260	
36(4,32) - 36(3,33)	281688.980(200)	281689.234(186)	3.5791	27.729	450.799	[70A]
15(1,15) - 14(0,14)	281762.600(200)	281762.598(38)	3.5836	11.646	65.264	[70A]
6(2, 4) - 5(1, 5)	282036.580(100)	282036.559(14)	3.9986	1.873	10.886	[70A]
20(1,19) - 20(0,20)	282292.800(100)	282292.797(51)	3.9991	5.884	128.811	[70A]
53(7,47) - 54(4,50)		282331.652(3226)	5.2231	0.916	993.234	
55(14,42) - 56(13,43)		282508.652(425)	4.3030	7.892	1306.939	
24(8,16) - 25(7,19)	282636.240(100)	282636.145(81)	4.3611	3.044	291.259	[70A]
16(0,16) - 15(1,15)	283464.600(100)	283464.785(36)	3.5687	12.600	74.663	[70A]
17(3,15) - 17(2,16)	285743.550(100)	285743.566(53)	3.7409	8.777	103.712	[70A]
33(5,29) - 34(2,32)	285768.270(100)	285768.383(230)	5.3342	0.428	393.023	[70A]
22(2,20) - 21(3,19)	286416.320(100)	286416.391(45)	4.0319	5.733	163.122	[70A]
29(9,21) - 30(8,22)	286651.460(100)	286651.191(95)	4.3252	3.817	406.281	[70A]
9(3, 7) - 10(0,10)		286769.328(22)	6.0842	0.021	34.549	
43(6,38) - 44(3,41)		287415.367(1019)	5.2517	0.661	659.183	
8(5, 3) - 9(4, 6)	287485.440(100)	287485.621(43)	4.6130	0.562	56.046	[70A]
41(5,37) - 42(2,40)		288117.617(473)	5.2975	0.564	586.013	
18(1,17) - 17(2,16)	288519.960(100)	288520.047(37)	3.8041	7.793	103.712	[70A]
34(10,24) - 35(9,27)		290338.387(114)	4.2965	4.589	540.651	
25(3,23) - 26(0,26)		290409.574(131)	5.7049	0.132	213.369	
51(6,46) - 52(3,49)		292363.074(1681)	5.2117	0.815	903.859	
33(4,30) - 34(1,33)		292670.707(158)	5.4156	0.331	377.306	
13(6, 8) - 14(5, 9)		292882.695(60)	4.4275	1.294	109.730	
21(4,18) - 22(1,21)		293386.195(92)	5.5081	0.170	165.450	
39(11,29) - 40(10,30)		293717.777(149)	4.2727	5.361	694.346	
53(7,47) - 52(8,44)		296004.348(182)	4.2125	8.150	992.778	
26(2,24) - 26(1,25)	296168.710(100)	296168.750(66)	3.7274	12.313	226.817	[70A]
24(4,20) - 24(3,21)	296535.490(100)	296535.391(92)	3.5917	15.500	210.144	[70A]
44(12,32) - 45(11,35)		296806.621(212)	4.2524	6.132	867.341	
49(6,44) - 48(7,41)		297257.223(167)	4.2405	6.980	838.676	
18(7,11) - 19(6,14)	297782.570(100)	297782.637(76)	4.3417	2.055	182.803	[70A]
9(2, 8) - 8(1, 7)		298576.297(24)	3.8409	3.317	25.518	
19(3,17) - 19(2,18)		299316.801(62)	3.6910	9.544	126.933	
49(13,37) - 50(12,38)		299615.145(310)	4.2349	6.904	1059.607	
32(3,29) - 32(2,30)		300273.637(95)	3.5940	19.697	350.500	
19(2,18) - 19(1,19)		301896.598(52)	3.9103	5.613	116.862	
54(14,40) - 55(13,43)		302150.738(460)	4.2197	7.675	1271.111	
23(8,16) - 24(7,17)		302236.156(91)	4.2881	2.825	275.255	
51(7,45) - 52(4,48)		303121.664(2913)	5.1717	0.802	924.807	
59(15,45) - 60(14,46)		304418.023(691)	4.2044	8.447	1501.819	
43(5,39) - 44(2,42)		305485.234(552)	5.2468	0.557	640.030	
31(5,27) - 32(2,30)		306098.332(194)	5.3083	0.348	350.500	
28(9,19) - 29(8,22)		306303.559(107)	4.2495	3.597	387.074	
7(5, 3) - 8(4, 4)		306738.969(47)	4.6443	0.380	50.295	
38(4,34) - 38(3,35)		307185.762(235)	3.4911	27.624	499.482	
41(6,36) - 42(3,39)		308233.914(864)	5.2106	0.562	603.692	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
30(2,28) - 31(1,31)		309547.871(295)	5.7394	0.121	299.932	
33(10,24) - 34(9,25)		310016.980(130)	4.2195	4.370	518.242	
53(6,48) - 54(3,51)		310854.090(1867)	5.1535	0.806	970.763	
12(6, 6) - 13(5, 9)		312258.535(65)	4.3867	1.086	100.778	
22(4,18) - 22(3,19)		312542.492(86)	3.5499	13.387	179.191	
3(3, 1) - 2(2, 0)		313279.742(17)	3.4690	2.491	8.747	
38(11,27) - 39(10,30)		313404.000(169)	4.1951	5.142	668.737	
28(3,25) - 27(4,24)		313412.516(65)	4.0220	5.670	269.669	
17(1,17) - 16(0,16)		313660.859(49)	3.4263	13.692	84.118	
35(4,32) - 36(1,35)		313900.383(203)	5.3626	0.321	420.745	
27(3,25) - 28(0,28)		314922.215(177)	5.6539	0.126	246.236	
7(3, 5) - 8(0, 8)		315395.250(20)	6.3324	0.007	22.727	
21(3,19) - 21(2,20)	316099.010(200)	316098.863(71)	3.6348	10.169	152.579	[70A]
43(12,32) - 44(11,33)		316481.730(236)	4.1746	5.914	838.536	
17(7,11) - 18(6,12)		317250.445(84)	4.2832	1.840	170.647	
52(7,45) - 51(8,44)		318088.332(256)	4.1069	8.218	959.136	
46(6,40) - 45(7,39)		318238.121(174)	4.1050	7.299	747.307	
48(13,35) - 49(12,38)		319263.008(341)	4.1572	6.686	1027.609	
40(5,35) - 40(4,36)		319277.641(457)	3.4092	31.252	561.844	
42(5,37) - 42(4,38)		319699.465(562)	3.3999	33.367	616.467	
59(8,52) - 58(9,49)		320087.922(277)	4.1028	9.229	1234.621	
19(4,16) - 20(1,19)		320475.605(88)	5.5277	0.113	138.228	
18(0,18) - 17(1,17)		321330.191(49)	3.3886	14.682	94.581	
40(5,35) - 39(6,34)		321420.746(119)	4.0823	6.501	561.772	
53(14,40) - 54(13,41)		321756.434(497)	4.1422	7.458	1235.924	
22(8,14) - 23(7,17)		321782.547(102)	4.2225	2.607	259.895	
58(8,50) - 57(9,49)		322437.961(378)	4.0879	9.184	1197.223	
34(4,30) - 33(5,29)		322475.711(86)	4.0483	5.931	402.555	
11(2,10) - 10(1, 9)		323026.445(33)	3.7305	4.088	38.027	
51(6,46) - 50(7,43)		323094.125(219)	4.1590	6.824	902.834	
22(1,21) - 22(0,22)		323526.371(69)	3.8652	5.839	154.658	
58(15,43) - 59(14,46)		323968.094(731)	4.1277	8.230	1463.448	
59(8,52) - 60(5,55)		324790.984(6889)	5.0916	0.906	1234.464	
27(9,19) - 28(8,20)		325900.848(121)	4.1805	3.378	368.510	
6(5, 1) - 7(4, 4)		325960.422(50)	4.7455	0.217	45.185	
40(3,37) - 41(2,40)		326410.941(518)	5.4019	0.297	539.568	
20(4,16) - 20(3,17)		326867.480(78)	3.5133	11.599	150.973	
38(5,33) - 38(4,34)		327217.262(365)	3.3946	28.542	509.729	
45(5,41) - 46(2,44)		327761.082(656)	5.1862	0.542	696.368	
32(10,22) - 33(9,25)		329645.688(147)	4.1487	4.150	496.476	
44(5,39) - 44(4,40)		329690.262(681)	3.3638	34.618	673.522	
11(6, 6) - 12(5, 7)		331580.324(71)	4.3617	0.884	92.468	
21(2,20) - 21(1,21)		332091.379(67)	3.8218	5.701	141.501	
4(3, 1) - 3(2, 2)		332505.266(17)	3.4828	2.595	10.659	
37(11,27) - 38(10,28)		333043.438(190)	4.1234	4.923	643.771	
59(6,54) - 58(7,51)		333361.090(587)	4.3403	4.731	1187.315	
55(7,49) - 54(8,46)		333984.895(252)	4.0656	8.256	1061.821	
55(6,50) - 56(3,53)		334276.430(2091)	5.0852	0.787	1039.976	
8(2, 6) - 7(1, 7)		334673.340(20)	3.8961	1.856	18.825	
49(7,43) - 50(4,46)		334765.207(2596)	5.1054	0.667	858.611	
29(5,25) - 30(2,28)		335773.195(172)	5.2847	0.261	310.258	
50(4,46) - 51(3,49)		335943.016(1067)	5.2278	0.508	847.405	
23(3,21) - 23(2,22)		336089.234(81)	3.5733	10.653	180.632	
42(12,30) - 43(11,33)		336114.270(262)	4.1025	5.696	810.373	
16(7, 9) - 17(6,12)		336669.633(92)	4.2337	1.626	159.134	
18(4,14) - 18(3,15)		338305.992(67)	3.4861	10.053	125.498	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency		−log(A)	S_{ij}	Energy lower st.	Reference
20(1,19) - 19(2,18)		338611.879(	52)	3.5424	9.757	126.933	
47(13,35) - 48(12,36)		338872.156(	374)	4.0849	6.468	996.252	
37(4,34) - 38(1,37)		339148.613(	283)	5.3037	0.308	466.519	
39(6,34) - 40(3,37)		339260.586(	716)	5.1620	0.449	550.456	
28(2,26) - 28(1,27)		340316.496(	81)	3.5885	12.018	260.960	
21(8,14) - 22(7,15)		341275.457(	113)	4.1639	2.389	245.178	
53(6,48) - 52(7,45)		341323.633(	286)	4.1248	6.506	969.746	
52(14,38) - 53(13,41)		341327.344(	538)	4.0699	7.240	1201.378	
40(4,36) - 40(3,37)		341403.691(	300)	3.3856	26.984	550.456	
36(5,31) - 36(4,32)		341674.293(	287)	3.3621	25.610	460.196	
29(3,27) - 30(0,30)		342634.176(	247)	5.6000	0.119	281.446	
34(3,31) - 34(2,32)		342761.934(	117)	3.4626	19.024	393.023	
57(15,43) - 58(14,44)		343487.156(	776)	4.0560	8.013	1425.717	
5(5, 1) - 6(4, 2)		345149.094(	52)	5.0083	0.085	40.715	
13(2,12) - 12(1,11)		345338.520(	44)	3.6233	5.028	53.108	
26(9,17) - 27(8,20)		345448.785(	136)	4.1176	3.159	350.590	
16(4,12) - 16(3,13)		346523.891(	55)	3.4699	8.660	102.750	
19(1,19) - 18(0,18)		346652.195(	61)	3.2824	15.741	105.299	
57(6,52) - 56(7,49)		347829.797(	475)	4.2113	5.415	1111.967	
24(2,22) - 23(3,21)		348387.953(	62)	3.7199	7.115	191.842	
5(3, 3) - 6(0, 6)		348633.379(	20)	6.7783	0.001	13.313	
31(10,22) - 32(9,23)		349226.824(	165)	4.0836	3.931	475.353	
46(5,41) - 46(4,42)		349784.516(	817)	3.3018	34.941	732.936	
55(6,50) - 54(7,47)		350110.758(	372)	4.1409	6.026	1039.448	
10(6, 4) 11(5, 7)		350862.879(	76)	4.3563	0.690	84.799	
5(3, 3) - 4(2, 2)		351257.242(	18)	3.4740	2.745	13.226	
14(4,10) - 14(3,11)		351873.895(	43)	3.4645	7.359	82.698	
36(11,25) - 37(10,28)		352639.004(	212)	4.0569	4.704	619.448	
47(5,43) - 48(2,46)		354084.141(	812)	5.1199	0.523	755.032	
12(4, 8) - 12(3, 9)		355045.551(	31)	3.4690	6.111	65.306	
32(2,30) - 33(1,33)		355153.582(	429)	5.6255	0.111	338.653	
17(4,14) - 18(1,17)		355186.426(	81)	5.5811	0.066	113.336	
41(12,30) - 42(11,31)		355706.301(	289)	4.0353	5.477	782.852	
15(7, 9) - 16(6,10)		356040.699(	101)	4.1937	1.416	148.263	
10(4, 6) - 10(3, 7)		356755.234(	23)	3.4841	4.888	50.538	
13(4,10) - 13(3,11)	357165.360(200)	357165.414(	37)	3.4545	6.704	73.551	[70A]
15(4,12) - 15(3,13)	357241.190(200)	357241.207(	50)	3.4414	7.928	92.118	[70A]
11(4, 8) - 11(3, 9)	357387.570(200)	357387.617(	27)	3.4708	5.490	57.549	[70A]
8(4, 4) - 8(3, 5)		357581.504(	19)	3.5149	3.660	38.368	
9(4, 6) - 9(3, 7)	357671.780(200)	357671.871(	20)	3.4955	4.275	44.115	[70A]
7(4, 4) - 7(3, 5)		357892.504(	20)	3.5415	3.030	33.247	
6(4, 2) - 6(3, 3)	357925.960(200)	357925.910(	21)	3.5845	2.378	28.776	[70A]
17(4,14) - 17(3,15)	357962.890(200)	357962.906(	64)	3.4288	9.158	113.244	[70A]
5(4, 2) - 5(3, 3)	358013.090(200)	358013.223(	23)	3.6615	1.684	24.943	[70A]
4(4, 0) - 4(3, 1)	358038.080(200)	358037.957(	25)	3.8388	0.916	21.750	[70A]
20(0,20) - 19(1,19)	358215.640(200)	358215.680(	64)	3.2345	16.744	116.862	[70A]
46(13,33) - 47(12,36)		358444.461(	408)	4.0174	6.249	965.537	
25(3,23) - 25(2,24)		359151.184(	90)	3.5079	11.012	211.076	
19(4,16) - 19(3,17)		359770.680(	77)	3.4147	10.383	136.917	
34(5,29) - 34(4,30)		360290.648(	225)	3.3191	22.797	413.312	
20(8,12) - 21(7,15)		360721.762(	125)	4.1122	2.174	231.104	
51(14,38) - 52(13,39)		360864.996(	580)	4.0024	7.022	1167.473	
57(6,52) - 58(3,55)		361724.141(2389)		5.0116	0.762	1111.503	
56(15,41) - 57(14,44)		362976.516(	825)	3.9888	7.795	1388.626	
21(4,18) - 21(3,19)		363159.258(	89)	3.3976	11.578	163.122	
24(1,23) - 24(0,24)		363890.793(	92)	3.7500	5.826	182.843	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	$-\log(A)$	S_{ij}	Energy lower st.	Reference
23(2,22) - 23(1,23)		363925.742(85)	3.7371	5.755	168.492	
25(9,17) - 26(8,18)		364949.883(151)	4.0605	2.941	333.313	
15(2,14) - 14(1,13)		366214.449(56)	3.5171	6.182	70.722	
39(4,36) - 40(1,39)		367658.063(420)	5.2423	0.293	514.629	
57(7,51) - 56(8,48)		368331.215(349)	3.9533	8.257	1133.546	
57(8,50) - 58(5,53)		368487.023(6340)	5.0015	0.738	1157.553	
23(4,20) - 23(3,21)		368629.945(99)	3.3761	12.714	191.842	
30(10,20) - 31(9,23)		368763.852(184)	4.0236	3.712	454.874	
9(6, 4) - 10(5, 5)		370108.754(82)	4.3774	0.506	77.771	
6(3, 3) - 5(2, 4)		371172.469(19)	3.4503	2.904	16.395	
35(11,25) - 36(10,26)		372193.004(235)	3.9953	4.484	595.768	
31(3,29) - 32(0,32)		372892.711(353)	5.5454	0.111	318.997	
27(5,23) 28(2,26)		374478.641(162)	5.2753	0.179	272.311	
42(3,39) - 43(2,42)		375176.211(794)	5.2724	0.277	591.178	
40(12,28) - 41(11,31)		375259.984(318)	3.9728	5.257	755.974	
14(7, 7) - 15(6,10)		375371.207(109)	4.1641	1.211	138.034	
25(4,22) - 25(3,23)		376641.117(108)	3.3493	13.759	223.056	
47(7,41) - 48(4,44)		377489.395(2275)	5.0355	0.524	794.646	
50(6,44) - 50(5,45)		377501.902(1692)	3.1879	39.239	872.576	
45(13,33) - 46(12,34)		377981.672(443)	3.9543	6.030	935.464	
60(8,52) - 59(9,51)		379030.191(577)	3.8795	9.449	1272.508	
48(5,43) - 48(4,44)		379782.500(977)	3.2184	34.494	794.646	
19(8,12) - 20(7,13)		380124.340(137)	4.0672	1.960	217.673	
52(6,46) - 52(5,47)		380160.098(1946)	3.1749	41.155	940.307	
50(14,36) - 51(13,39)		380370.902(624)	3.9390	6.803	1134.208	
54(7,47) - 53(8,46)		380384.398(390)	3.8758	8.493	1026.759	
21(1,21) - 20(0,20)		380433.738(75)	3.1507	17.783	128.811	
37(6,32) - 38(3,35)		380466.980(582)	5.1171	0.335	499.482	
32(5,27) - 32(4,28)		380491.492(181)	3.2724	20.302	369.135	
55(15,41) - 56(14,42)		382437.445(877)	3.9255	7.576	1352.174	
42(4,38) - 42(3,39)		382974.055(385)	3.2709	26.124	603.692	
30(3,27) - 29(4,26)		383018.176(83)	3.7181	6.692	306.272	
49(5,45) - 50(2,48)		383652.496(1060)	5.0515	0.502	816.023	
24(9,15) - 25(8,18)		384408.227(167)	4.0088	2.723	316.678	
48(6,42) - 48(5,43)		384444.504(1451)	3.1774	36.557	807.314	
3(3, 1) - 4(0, 4)		384836.527(23)	7.7080	0.000	6.360	
30(2,28) - 30(1,29)		384935.480(99)	3.4635	11.850	297.418	
27(3,25) - 27(2,26)		385028.605(101)	3.4402	11.265	243.898	
22(1,21) - 21(2,20)		385871.926(69)	3.3277	11.864	152.579	
17(2,16) - 16(1,15)		386604.477(68)	3.4103	7.586	90.817	
48(6,42) - 47(7,41)		386737.605(256)	3.8500	7.632	807.238	
52(4,48) - 53(3,51)		387504.496(1592)	5.0850	0.478	911.882	
27(4,24) - 27(3,25)		387564.598(117)	3.3166	14.683	256.741	
29(10,20) - 30(9,21)		388259.383(204)	3.9683	3.493	435.037	
7(3, 5) - 6(2, 4)		388322.824(22)	3.4270	3.087	20.294	
36(3,33) - 36(2,34)		388912.488(150)	3.3352	18.476	437.827	
8(6, 2) - 9(5, 5)		389325.160(87)	4.4388	0.338	71.383	
34(11,23) - 35(10,26)		391707.969(260)	3.9381	4.265	572.731	
59(6,54) - 60(3,57)		392367.309(2814)	4.9364	0.734	1185.347	
54(6,48) - 54(5,49)		393399.137(2221)	3.1367	42.093	1010.427	
22(0,22) - 21(1,21)		394436.930(79)	3.0994	18.791	141.501	
42(5,37) - 41(6,36)		394439.605(165)	3.8059	6.976	613.974	
10(2, 8) - 9(1, 9)		394581.922(29)	3.8188	1.671	29.185	
13(7, 7) - 14(6, 8)		394664.770(118)	4.1463	1.010	128.446	
39(12,28) - 40(11,29)		394777.316(348)	3.9144	5.038	729.738	
36(4,32) - 35(5,31)		396079.816(110)	3.7557	6.642	446.984	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
15(4,12) - 16(1,15)		396264.648(71)	5.6811	0.033	90.817	
25(2,24) - 25(1,25)		397009.730(109)	3.6566	5.790	197.833	
44(13,31) - 45(12,34)		397485.516(481)	3.8952	5.811	906.032	
59(7,53) - 58(8,50)		397571.824(478)	3.8755	8.129	1207.978	
41(4,38) - 42(1,41)		398730.551(636)	5.1806	0.278	565.074	
34(2,32) - 35(1,35)		398913.117(627)	5.5326	0.103	379.717	
46(6,40) - 46(5,41)		399301.285(1221)	3.1480	33.473	744.603	
18(8,10) - 19(7,13)		399487.848(150)	4.0292	1.748	204.883	
49(14,36) - 50(13,37)		399846.516(670)	3.8795	6.584	1101.584	
30(5,25) - 30(4,26)		399914.770(152)	3.2280	18.176	327.708	
29(4,26) - 29(3,27)		401652.836(129)	3.2779	15.469	292.875	
54(15,39) - 55(14,42)		401871.188(933)	3.8660	7.358	1316.362	
26(1,25) - 26(0,26)		403152.906(122)	3.6505	5.827	213.369	
59(16,44) - 60(15,45)		403568.133(1300)	3.8583	8.096	1550.330	
23(9,15) - 24(8,16)		403826.793(184)	3.9624	2.507	300.686	
33(3,31) - 34(0,34)		405106.012(514)	5.4917	0.105	358.891	
19(2,18) - 18(1,17)		407605.996(81)	3.3026	9.243	113.336	
28(10,18) - 29(9,21)		407716.344(225)	3.9177	3.275	415.843	
7(6, 2) - 8(5, 3)		408516.766(91)	4.5713	0.190	65.635	
26(2,24) - 25(3,23)		408912.086(80)	3.4540	8.778	223.056	
8(3, 5) - 7(2, 6)		410608.223(25)	3.3896	3.226	24.671	
33(11,23) - 34(10,24)		411186.164(286)	3.8850	4.046	550.336	
29(3,27) - 29(2,28)		413375.184(114)	3.3715	11.438	279.086	
12(7, 5) - 13(6, 8)		413926.430(126)	4.1430	0.817	119.500	
38(12,26) - 39(11,29)		414260.289(379)	3.8598	4.818	704.144	
23(1,23) - 22(0,22)		414742.555(89)	3.0298	19.816	154.658	
51(5,47) - 52(2,50)		415740.801(1439)	4.9834	0.480	879.341	
28(5,23) - 28(4,24)		416825.668(135)	3.1903	16.360	289.053	
43(13,31) - 44(12,32)		416957.664(519)	3.8398	5.592	877.241	
56(6,50) - 56(5,51)		417454.496(2527)	3.0752	42.073	1082.861	
50(5,45) - 50(4,46)		418673.609(1173)	3.1205	33.586	858.611	
17(8,10) - 18(7,11)		418815.738(162)	3.9986	1.540	192.736	
31(4,28) - 31(3,29)		419019.250(148)	3.2337	16.106	331.436	
48(14,34) - 49(13,37)		419293.254(718)	3.8235	6.365	1069.601	
44(6,38) - 44(5,39)		419770.523(1004)	3.1060	30.370	684.519	
25(5,21) - 26(2,24)		421207.531(158)	5.2896	0.113	236.696	
53(15,39) - 54(14,40)		421278.953(992)	3.8097	7.139	1281.190	
44(3,41) - 45(2,44)		421448.730(1182)	5.1681	0.260	645.125	
58(16,42) - 59(15,45)		422924.344(1366)	3.8013	7.883	1511.973	
22(9,13) - 23(8,16)		423208.930(201)	3.9213	2.293	285.336	
9(3, 7) - 8(2, 6)		423513.699(30)	3.3698	3.439	29.988	
55(8,48) - 56(5,51)		423756.441(5758)	4.9140	0.573	1082.861	
27(10,18) - 28(9,19)		427137.320(247)	3.8714	3.057	397.291	
6(6, 0) - 7(5, 3)		427688.555(95)	4.8684	0.072	60.527	
32(2,30) - 32(1,31)		428768.125(123)	3.3536	11.770	336.198	
44(4,40) - 44(3,41)		429864.887(499)	3.1542	25.308	659.183	
24(1,23) - 23(2,22)		430193.816(88)	3.1502	14.030	180.632	
24(0,24) - 23(1,23)		430228.766(95)	2.9786	20.825	168.492	
21(2,20) - 20(1,19)		430232.320(93)	3.1944	11.117	138.228	
26(5,21) - 26(4,22)		430347.645(123)	3.1617	14.763	253.170	
32(11,21) - 33(10,24)		430629.879(313)	3.8358	3.827	528.583	
45(7,39) - 46(4,42)		430847.684(1956)	4.9730	0.390	732.936	
27(2,26) - 27(1,27)		431001.551(142)	3.5807	5.812	229.521	
35(6,30) - 36(3,33)		431127.246(464)	5.0860	0.234	450.799	
43(4,40) - 44(1,43)		431745.559(955)	5.1204	0.264	617.856	
11(7, 5) - 12(6, 6)		433160.176(134)	4.1586	0.633	111.194	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
37(12,26) - 38(11,27)		433710.801(412)	3.8089	4.599	679.191	
4(4, 0) - 3(3, 1)		434585.148(25)	3.0051	3.491	19.197	
60(7,53) - 60(6,54)		434993.453(4590)	3.0015	47.189	1250.973	
54(4,50) - 55(3,53)		436046.059(2291)	4.9711	0.453	978.689	
42(13,29) - 43(12,32)		436399.734(560)	3.7877	5.372	849.092	
38(3,35) - 38(2,36)		436578.898(200)	3.2165	18.107	484.919	
16(8, 8) - 17(7,11)		438111.766(175)	3.9761	1.336	181.229	
47(14,34) - 48(13,35)		438712.508(768)	3.7707	6.145	1038.258	
35(3,33) - 36(0,36)		438761.191(748)	5.4400	0.098	401.126	
33(4,30) - 33(3,31)		439632.781(178)	3.1847	16.601	372.404	
24(5,19) - 24(4,20)		440412.715(113)	3.1427	13.305	220.036	
58(7,51) - 58(6,52)		440489.262(4124)	2.9951	44.599	1172.622	
52(15,37) - 53(14,40)		*440661.922(1052)*	*3.7566*	*6.919*	*1246.657*	
36(2,34) - 37(1,37)		440850.430(907)	5.4562	0.096	423.122	
28(1,27) - 28(0,28)		441395.711(163)	3.5637	5.832	246.236	
13(4,10) - 14(1,13)		441996.785(58)	5.8376	0.015	70.722	
57(16,42) - 58(15,43)		442258.488(1437)	3.7474	7.669	1474.255	
21(9,13) - 22(8,14)		442557.582(218)	3.8855	2.080	270.628	
42(6,36) - 42(5,37)		443180.098(806)	3.0580	27.529	627.131	
31(3,29) - 31(2,30)		443791.793(132)	3.3033	11.551	316.632	
26(10,16) - 27(9,19)		446524.918(270)	3.8293	2.841	379.381	
22(5,17) - 22(4,18)		447487.344(102)	3.1321	11.934	189.617	
56(7,49) - 55(8,48)		448796.039(579)	3.6617	8.776	1096.996	
25(1,25) - 24(0,24)		449384.289(104)	2.9185	21.843	182.843	
53(5,49) - 54(2,52)		449714.109(1988)	4.9175	0.458	944.988	
31(11,21) - 32(10,22)		450041.266(341)	3.7903	3.609	507.472	
10(3, 7) - 9(2, 8)		451490.383(36)	3.3225	3.498	35.478	
58(6,52) - 58(5,53)		451759.664(2886)	2.9952	41.325	1157.553	
20(5,15) - 20(4,16)		452247.785(89)	3.1285	10.622	161.877	
10(7, 3) - 11(6, 6)		452370.051(142)	4.2005	0.461	103.528	
32(3,29) - 31(4,28)		452787.293(104)	3.4517	7.972	345.412	
36(12,24) - 37(11,27)		453130.703(447)	3.7613	4.380	654.880	
25(5,21) - 25(4,22)		453478.496(122)	3.1052	13.827	235.619	
27(5,23) - 27(4,24)		453704.035(134)	3.0982	15.133	269.669	
5(4, 2) - 4(3, 1)		453717.133(24)	3.0261	3.573	21.750	
23(5,19) - 23(4,20)		454098.203(111)	3.1110	12.523	204.139	
56(7,49) - 56(6,50)		455097.984(3659)	2.9694	41.441	1096.786	
23(2,22) - 22(1,21)		455141.922(106)	3.0873	13.136	165.450	
21(5,17) - 21(4,18)		455159.629(98)	3.1165	11.234	175.236	
29(5,25) - 29(4,26)		*455247.281(149)*	*3.0888*	*16.421*	*306.272*	
18(5,13) - 18(4,14)		455348.285(74)	3.1304	9.351	136.782	
11(3, 9) - 10(2, 8)		455768.563(43)	3.3152	3.787	42.347	
41(13,29) - 42(12,30)		455813.313(601)	3.7388	5.152	821.584	
19(5,15) - 19(4,16)		456352.367(83)	3.1227	9.967	148.917	
16(5,11) - 16(4,12)		457315.559(58)	3.1369	8.109	114.309	
15(8, 8) - 16(7, 9)		457379.262(187)	3.9629	1.137	170.364	
17(5,13) - 17(4,14)		457466.871(67)	3.1305	8.722	125.184	
46(14,32) - 47(13,35)		458105.617(820)	3.7209	5.926	1007.556	
15(5,11) - 15(4,12)		458386.801(51)	3.1410	7.494	104.035	
14(5, 9) - 14(4,10)		458531.734(43)	3.1484	6.886	94.435	
31(5,27) - 31(4,28)		458611.988(174)	3.0760	17.662	345.412	
13(5, 9) - 13(4,10)		459070.609(37)	3.1561	6.276	85.465	
12(5, 7) - 12(4, 8)		459258.043(32)	3.1665	5.666	77.149	
11(5, 7) - 11(4, 8)		459528.473(29)	3.1794	5.052	69.471	
10(5, 5) - 10(4, 6)		459668.449(28)	3.1965	4.431	62.438	
9(5, 5) - 9(4, 6)		459799.984(30)	3.2196	3.797	56.046	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
8(5, 3) - 8(4, 4)		459879.090(33)	3.2530	3.145	50.295	
7(5, 3) - 7(4, 4)		459936.211(37)	3.3046	2.463	45.185	
6(5, 1) - 6(4, 2)		459969.281(41)	3.3946	1.735	40.715	
5(5, 1) - 5(4, 2)		459987.281(45)	3.5918	0.932	36.885	
51(15,37) - 52(14,38)		460021.246(1116)	3.7063	6.700	1212.764	
50(6,44) - 49(7,43)		461410.309(380)	3.6157	8.025	869.777	
56(16,40) - 57(15,43)		461571.563(1511)	3.6963	7.454	1437.175	
20(9,11) - 21(8,14)		461875.699(236)	3.8553	1.871	256.562	
12(2,10) - 11(1,11)		463011.414(41)	3.7670	1.387	41.953	
35(4,32) - 35(3,33)		463326.641(221)	3.1320	16.968	415.761	
33(5,29) - 33(4,30)		464288.113(216)	3.0590	18.827	387.068	
52(5,47) - 52(4,48)		464666.832(1422)	3.0152	32.550	924.807	
46(3,43) - 47(2,46)		465411.551(1709)	5.0828	0.246	701.409	
29(2,28) - 29(1,29)		465621.602(190)	3.5094	5.827	263.554	
26(0,26) - 25(1,25)		465751.336(111)	2.8690	22.851	197.833	
25(10,16) - 26(9,17)		465881.590(293)	3.7915	2.626	362.113	
45(4,42) - 46(1,45)		466172.977(1402)	5.0628	0.250	672.973	
28(2,26) - 27(3,25)		466789.988(100)	3.2271	10.703	256.741	
40(6,34) - 40(5,35)		466888.680(631)	3.0098	25.069	572.494	
30(11,19) - 31(10,22)		469422.441(371)	3.7483	3.391	487.002	
34(2,32) - 34(1,33)		471190.438(158)	3.2577	11.739	377.306	
9(7, 3) - 10(6, 4)		471559.695(149)	4.2830	0.304	96.502	
26(1,25) - 25(2,24)		471894.516(105)	3.0014	16.196	211.076	
38(4,34) - 37(5,33)		472038.051(146)	3.4945	7.554	493.983	
44(5,39) - 43(6,38)		472139.781(237)	3.5554	7.582	668.771	
35(12,24) - 36(11,25)		472521.793(482)	3.7169	4.161	631.211	
35(5,31) - 35(4,32)		472706.629(278)	3.0370	19.886	431.216	
6(4, 2) - 5(3, 3)		472851.410(24)	3.0296	3.701	24.943	
37(3,35) - 38(0,38)		473433.973(1077)	5.3909	0.093	445.701	
23(5,19) - 24(2,22)		474340.195(155)	5.3334	0.066	203.463	
40(13,27) - 41(12,30)		475199.930(645)	3.6928	4.933	794.717	
33(3,31) - 33(2,32)		475865.871(157)	3.2364	11.623	356.530	
14(8, 6) - 15(7, 9)		476621.488(199)	3.9609	0.944	160.139	
54(7,47) - 54(6,48)		476629.922(3193)	2.9298	38.121	1023.549	
45(14,32) - 46(13,33)		477473.906(873)	3.6739	5.706	977.494	
30(1,29) - 30(0,30)		478825.617(222)	3.4866	5.838	281.446	
50(15,35) - 51(14,38)		479358.063(1181)	3.6586	6.480	1179.510	
46(4,42) - 46(3,43)		479734.109(653)	3.0412	24.678	716.934	
55(16,40) - 56(15,41)		480864.531(1589)	3.6479	7.238	1400.734	
19(9,11) - 20(8,12)		481166.039(253)	3.8311	1.664	243.137	
38(2,36) - 39(1,39)		481232.621(1295)	5.3922	0.090	468.867	
56(4,52) - 57(3,55)		481881.008(3199)	4.8781	0.431	1047.825	
25(2,24) - 24(1,23)		482503.227(117)	2.9826	15.225	194.981	
40(3,37) - 40(2,38)		483994.699(273)	3.1093	17.895	534.312	
37(5,33) - 37(4,34)		484200.547(364)	3.0097	20.812	477.832	
27(1,27) - 26(0,26)		484227.477(120)	2.8155	23.864	213.369	
13(3,11) - 12(2,10)		484270.867(59)	3.2662	4.149	57.398	
55(5,51) - 56(2,54)		485036.152(2742)	4.8547	0.438	1012.962	
24(10,14) - 25(9,17)		485209.719(317)	3.7579	2.413	345.486	
38(6,32) - 38(5,33)		488729.316(485)	2.9661	22.974	520.644	
29(11,19) - 30(10,20)		488775.430(401)	3.7099	3.175	467.174	
53(8,46) - 54(5,49)		489644.660(5148)	4.8383	0.426	1010.427	
33(6,28) - 34(3,31)		489809.691(369)	5.0749	0.155	404.456	
37(4,34) - 37(3,35)		489820.184(279)	3.0768	17.229	461.493	
11(4, 8) - 12(1,11)		490538.723(46)	6.0620	0.005	53.108	
8(7, 1) - 9(6, 4)		490732.527(155)	4.4379	0.169	90.116	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
34(12,22) - 35(11,25)		491885.809(519)	3.6755	3.943	608.183	
7(4, 4) - 6(3, 3)		491934.770(25)	3.0227	3.852	28.776	
43(7,37) - 44(4,40)		493642.395(1644)	4.9255	0.277	673.522	
39(13,27) - 40(12,28)		494561.070(690)	3.6496	4.714	768.491	
12(3, 9) - 11(2,10)		494779.715(51)	3.2576	3.674	48.802	
60(6,54) - 60(5,55)		494915.883(3328)	2.9029	40.197	1234.464	
13(8, 6) - 14(7, 7)		495841.484(211)	3.9730	0.759	150.555	
44(14,30) - 45(13,33)		496818.648(928)	3.6295	5.487	948.072	
49(15,35) - 50(14,36)		498673.461(1248)	3.6135	6.260	1146.896	
39(5,35) - 39(4,36)		498976.766(476)	2.9772	21.591	526.893	
54(16,38) - 55(15,41)		500138.336(1670)	3.6020	7.022	1364.931	
18(9, 9) - 19(8,12)		500431.266(271)	3.8135	1.461	230.352	
31(2,30) - 31(1,31)		500654.750(261)	3.4426	5.837	299.932	
28(0,28) - 27(1,27)		501107.941(128)	2.7685	24.871	229.521	
59(17,43) - 60(16,44)		501224.461(2227)	3.5510	7.785	1602.141	
47(4,44) - 48(1,47)		501578.324(2007)	5.0083	0.238	730.426	
52(7,45) 52(6,46)		502404.316(2735)	2.8823	34.977	952.988	
23(10,14) - 24(9,15)		504511.582(341)	3.7287	2.202	329.501	
36(6,30) - 36(5,31)		507331.211(367)	2.9300	21.161	471.593	
48(3,45) - 49(2,48)		507442.125(2407)	5.0116	0.233	760.028	
28(11,17) - 29(10,20)		508102.195(432)	3.6748	2.960	447.988	
15(3,13) - 14(2,12)		508709.809(76)	3.2213	4.558	75.150	
39(3,37) - 40(0,40)		508789.445(1528)	5.3447	0.087	492.617	
35(3,33) - 35(2,34)		509206.109(199)	3.1716	11.670	398.776	
7(7, 1) - 8(6, 2)		509891.695(161)	4.7594	0.063	84.369	
8(4, 4) - 7(3, 5)		511089.742(28)	3.0093	4.016	33.247	
33(12,22) - 34(11,23)		511224.438(557)	3.6371	3.725	585.797	
28(1,27) - 27(2,26)		511502.102(122)	2.8741	18.337	243.898	
27(2,26) - 26(1,25)		512076.121(129)	2.8816	17.332	226.817	
36(2,34) - 36(1,35)		512085.105(213)	3.1740	11.732	420.745	
38(13,25) - 39(12,28)		513898.195(736)	3.6092	4.495	742.906	
12(8, 4) - 13(7, 7)		515042.133(222)	4.0037	0.585	141.611	
54(5,49) - 54(4,50)		515424.379(1749)	2.9088	31.631	993.234	
32(1,31) - 32(0,32)		515657.496(308)	3.4172	5.844	318.997	
43(14,30) - 44(13,31)		516141.098(984)	3.5877	5.267	919.291	
41(5,37) - 41(4,38)		517101.227(613)	2.9397	22.220	578.374	
48(15,33) - 49(14,36)		517968.520(1317)	3.5707	6.041	1114.922	
3(3, 1) - 2(0, 2)		518187.273(28)	7.1910	0.000	1.912	
39(4,36) - 39(3,37)		518751.027(354)	3.0201	17.407	509.589	
29(1,29) - 28(0,28)		519187.848(138)	2.7200	25.881	246.236	
53(16,38) - 54(15,39)		519393.906(1754)	3.5583	6.805	1329.767	
17(9, 9) - 18(8,10)		519673.898(289)	3.8034	1.263	218.209	
40(2,38) - 41(1,41)		520396.969(1817)	5.3375	0.085	516.953	
58(17,41) - 59(16,44)		520429.121(2324)	3.5134	7.569	1563.792	
30(2,28) - 29(3,27)		521126.922(121)	3.0346	12.823	292.875	
57(5,53) - 58(2,56)		521270.801(3738)	4.7956	0.419	1083.265	
34(3,31) - 33(4,30)		521281.664(131)	3.2162	9.540	387.068	
34(6,28) - 34(5,29)		522192.207(280)	2.9026	19.536	425.330	
58(7,51) - 57(8,50)		523761.898(846)	3.4599	9.097	1169.844	
22(10,12) - 23(9,15)		523789.383(366)	3.7041	1.994	314.157	
58(4,54) - 59(3,57)		525472.594(4357)	4.8006	0.411	1119.290	
27(11,17) - 28(10,18)		527404.633(463)	3.6433	2.746	429.443	
17(3,15) - 16(2,14)		529290.984(95)	3.1771	5.058	95.589	
50(7,43) - 50(6,44)		529610.336(2298)	2.8327	32.199	885.168	
9(4, 6) - 8(3, 5)		529974.969(33)	2.9923	4.186	38.368	
42(3,39) - 42(2,40)		530031.852(377)	3.0144	17.789	586.013	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
48(4,44) - 48(3,45)		530382.266(860)	2.9361	24.263	776.955	
32(12,20) - 33(11,23)		530539.313(597)	3.6017	3.509	564.051	
21(5,17) - 22(2,20)		531902.492(148)	5.4083	0.036	172.676	
37(13,25) - 38(12,26)		533212.711(784)	3.5713	4.277	717.962	
32(6,26) - 32(5,27)		533497.148(218)	2.8835	18.032	381.827	
11(8, 4) - 12(7, 5)		534226.141(233)	4.0609	0.422	133.307	
42(14,28) - 43(13,31)		535442.469(1042)	3.5482	5.048	891.150	
33(2,32) - 33(1,33)		535944.297(364)	3.3800	5.845	338.653	
30(0,30) - 29(1,29)		536362.609(148)	2.6755	26.888	263.554	
47(15,33) - 48(14,34)		537244.297(1388)	3.5302	5.821	1083.587	
49(4,46) - 50(1,49)		537620.281(2802)	4.9573	0.226	790.212	
43(5,39) - 43(4,40)		538498.281(776)	2.8979	22.705	632.257	
52(16,36) - 53(15,39)		538632.148(1841)	3.5168	6.587	1295.242	
16(9, 7) - 17(8,10)		538896.352(306)	3.8023	1.071	206.706	
57(17,41) - 58(16,42)		539618.516(2425)	3.4769	7.353	1526.080	
9(4, 6) - 10(1, 9)		540201.906(37)	6.3739	0.002	38.027	
14(2,12) - 13(1,13)		540604.570(58)	3.7350	1.089	57.117	
52(6,46) - 51(7,45)		541705.266(567)	3.3972	8.527	934.918	
14(3,11) - 13(2,12)		541750.891(71)	3.1998	3.710	64.627	
30(6,24) - 30(5,25)		541810.867(179)	2.8716	16.606	341.047	
21(10,12) - 22(9,13)		543045.219(390)	3.6846	1.788	299.453	
29(2,28) - 28(1,27)		543413.734(142)	2.7850	19.431	260.960	
37(3,35) - 37(2,36)		543467.500(265)	3.1094	11.700	443.365	
41(3,39) - 42(0,42)		544575.125(2128)	5.3016	0.083	541.873	
37(6,32) - 37(5,33)		545319.266(436)	2.8441	21.331	493.983	
35(6,30) - 35(5,31)		545517.828(328)	2.8486	19.966	446.984	
19(3,17) - 18(2,16)		546579.844(113)	3.1308	5.694	118.685	
26(11,15) - 27(10,18)		546684.578(495)	3.6153	2.534	411.539	
39(6,34) - 39(5,35)		546696.391(578)	2.8371	22.663	543.537	
33(6,28) - 33(5,29)		546803.242(250)	2.8513	18.591	402.555	
28(6,22) - 28(5,23)		547802.469(154)	2.8652	15.236	302.957	
50(3,47) - 51(2,50)		547954.727(3312)	4.9507	0.222	820.982	
31(6,26) - 31(5,27)		548734.672(198)	2.8532	17.223	360.710	
40(4,36) - 39(5,35)		548839.500(209)	3.2580	8.715	543.537	
10(4, 6) - 9(3, 7)		549303.406(40)	2.9718	4.356	44.115	
30(1,29) - 29(2,28)		549566.625(140)	2.7627	20.448	279.086	
41(4,38) - 41(3,39)		549712.688(449)	2.9631	17.524	560.038	
31(12,20) - 32(11,21)		549832.016(637)	3.5691	3.293	542.947	
41(6,36) - 41(5,37)		550148.141(755)	2.8267	23.932	595.623	
29(6,24) - 29(5,25)		550946.992(167)	2.8549	15.874	321.458	
38(2,36) - 38(1,37)		551622.547(300)	3.1002	11.734	466.519	
34(1,33) - 34(0,34)		552068.086(432)	3.3538	5.850	358.891	
26(6,20) - 26(5,21)		552079.031(138)	2.8630	13.910	267.525	
36(13,23) - 37(12,26)		552505.984(833)	3.5359	4.060	693.658	
27(6,22) - 27(5,23)		553165.070(147)	2.8570	14.549	284.803	
46(5,41) - 45(6,40)		553215.461(358)	3.3250	8.373	726.150	
10(8, 2) - 11(7, 5)		553396.039(242)	4.1593	0.277	125.643	
31(1,31) - 30(0,30)		554213.227(161)	2.6309	27.895	281.446	
31(6,26) - 32(3,29)		554559.359(301)	5.0862	0.098	360.516	
41(14,28) - 42(13,29)		554723.945(1102)	3.5110	4.830	863.649	
24(6,18) - 24(5,19)		555121.664(123)	2.8641	12.618	234.726	
25(6,20) - 25(5,21)		555204.258(131)	2.8600	13.252	250.746	
5(5, 1) - 4(4, 0)		555666.461(41)	2.6626	4.492	33.693	
48(7,41) - 48(6,42)		555753.242(1895)	2.7857	29.823	820.138	
43(6,38) - 43(5,39)		556141.031(970)	2.8122	25.109	650.220	
46(15,31) - 47(14,34)		556501.805(1461)	3.4918	5.602	1052.892	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
23(6,18) - 23(5,19)		556960.023(116)	2.8643	11.980	219.286	
5(3, 3) - 4(0, 4)		557087.633(29)	6.0723	0.002	6.360	
22(6,16) - 22(5,17)		557283.359(108)	2.8679	11.354	204.543	
51(16,36) - 52(15,37)		557853.945(1929)	3.4774	6.369	1261.356	
59(5,55) - 60(2,58)		558077.039(5019)	4.7403	0.401	1155.894	
15(9, 7) - 16(8, 8)		558100.930(322)	3.8120	0.886	195.843	
21(6,16) - 21(5,17)		558391.047(100)	2.8701	10.730	190.419	
42(2,40) - 43(1,43)		558654.164(2503)	5.2898	0.081	567.378	
56(17,39) - 57(16,42)		558793.406(2530)	3.4416	7.136	1489.007	
20(6,14) - 20(5,15)		558812.648(91)	2.8742	10.113	176.962	
19(6,14) - 19(5,15)		559500.516(83)	2.8781	9.498	164.140	
18(6,12) - 18(5,13)		559882.258(74)	2.8833	8.886	151.971	
17(6,12) - 17(5,13)		560319.016(65)	2.8890	8.277	140.444	
16(6,10) - 16(5,11)		560613.633(57)	2.8960	7.667	129.563	
15(6,10) - 15(5,11)		560891.078(50)	2.9042	7.057	119.325	
14(6, 8) - 14(5, 9)		561094.945(46)	2.9142	6.445	109.730	
13(6, 8) - 13(5, 9)		561265.742(44)	2.9265	5.827	100.778	
21(3,19) - 20(2,18)		561361.359(130)	3.0803	6.509	144.397	
12(6, 6) - 12(5, 7)		561393.016(45)	2.9421	5.202	92.468	
11(6, 6) - 11(5, 7)		561490.641(48)	2.9623	4.565	84.799	
10(6, 4) - 10(5, 5)		561560.422(54)	2.9896	3.913	77.771	
9(6, 4) - 9(5, 5)		561608.758(60)	3.0283	3.237	71.383	
8(6, 2) - 8(5, 3)		561639.516(66)	3.0872	2.529	65.635	
7(6, 2) - 7(5, 3)		561656.891(73)	3.1871	1.773	60.527	
6(6, 0) - 6(5, 1)		561664.344(79)	3.3987	0.944	56.058	
20(10,10) - 21(9,13)		562281.125(414)	3.6704	1.587	285.391	
45(5,41) - 45(4,42)		562963.789(968)	2.8527	23.063	688.523	
41(7,35) - 42(4,38)		564031.734(1349)	4.8967	0.189	616.467	
51(8,44) - 52(5,47)		564476.078(4525)	4.7792	0.307	940.307	
45(6,40) - 45(5,41)		565068.305(1225)	2.7931	26.165	707.301	
25(11,15) - 26(10,16)		565943.797(528)	3.5910	2.325	394.275	
11(4, 8) - 10(3, 7)		567592.758(48)	2.9518	4.528	50.538	
56(5,51) - 56(4,52)		568467.898(2177)	2.8063	30.945	1063.899	
30(12,18) - 31(11,21)		569104.094(678)	3.5394	3.079	522.483	
35(2,34) - 35(1,35)		571381.531(510)	3.3213	5.852	379.717	
32(2,30) - 31(3,29)		571532.906(145)	2.8723	15.052	331.436	
32(0,32) - 31(1,31)		571553.828(176)	2.5889	28.900	299.932	
35(13,23) - 36(12,24)		571779.359(883)	3.5030	3.843	669.995	
9(8, 2) - 10(7, 3)		572554.211(251)	4.3309	0.152	118.618	
40(14,26) - 41(13,29)		573986.680(1163)	3.4760	4.611	836.788	
51(4,48) - 52(1,51)		574041.938(3826)	4.9097	0.216	852.333	
44(3,41) - 44(2,42)		574210.898(520)	2.9312	17.743	640.030	
23(3,21) - 22(2,20)		574587.828(144)	3.0243	7.548	172.676	
6(5, 1) - 5(4, 2)		574807.469(37)	2.6847	4.558	36.885	
45(15,31) - 46(14,32)		575742.055(1536)	3.4554	5.383	1022.836	
31(2,30) - 30(1,29)		576042.359(159)	2.6933	21.514	297.418	
50(16,34) - 51(15,37)		577060.172(2020)	3.4399	6.151	1228.108	
47(6,42) - 47(5,43)		577216.156(1520)	2.7691	27.080	766.843	
14(9, 5) - 15(8, 8)		577289.805(339)	3.8356	0.709	185.620	
55(17,39) - 56(16,40)		577954.555(2639)	3.4074	6.918	1452.571	
39(3,37) - 39(2,38)		578364.820(368)	3.0501	11.721	490.297	
46(7,39) - 46(6,40)		579036.188(1536)	2.7446	27.785	757.923	
50(4,46) - 50(3,47)		580134.180(1131)	2.8412	24.022	839.259	
43(3,41) - 44(0,44)		580609.063(2909)	5.2613	0.078	593.467	
19(10,10) - 20(9,11)		581499.039(438)	3.6625	1.390	271.968	
43(4,40) - 43(3,41)		582291.961(570)	2.9066	17.600	612.834	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
24(11,13) - 25(10,16)		585183.977(560)	3.5706	2.117	377.653	
32(1,31) - 31(2,30)		586556.578(163)	2.6632	22.534	316.632	
36(3,33) - 35(4,32)		587097.211(174)	3.0086	11.393	431.216	
52(3,49) - 53(2,52)		587317.125(4463)	4.8978	0.211	884.268	
25(3,23) - 24(2,22)		587371.039(156)	2.9623	8.843	203.463	
12(4, 8) - 11(3, 9)		587568.359(57)	2.9278	4.688	57.549	
36(1,35) - 36(0,36)		588187.445(604)	3.2953	5.856	401.126	
29(12,18) - 30(11,19)		588357.023(720)	3.5126	2.867	502.660	
33(1,33) - 32(0,32)		589272.039(195)	2.5474	29.906	318.997	
7(4, 4) - 8(1, 7)		589599.664(35)	6.8183	0.000	25.518	
60(8,52) - 60(7,53)		589651.227(6197)	2.6826	39.495	1265.483	
40(2,38) - 40(1,39)		590075.938(429)	3.0341	11.741	514.629	
47(5,43) - 47(4,44)		590189.953(1190)	2.8051	23.317	747.156	
34(13,21) - 35(12,24)		591034.117(935)	3.4725	3.627	646.973	
8(8, 0) - 9(7, 3)		591702.859(259)	4.6710	0.056	112.232	
19(5,15) - 20(2,18)		591858.148(135)	5.5146	0.019	144.397	
49(6,44) - 49(5,45)		592740.977(1858)	2.7404	27.843	828.820	
39(14,26) - 40(13,27)		593231.813(1226)	3.4432	4.394	810.568	
7(5, 3) - 6(4, 2)		593945.070(34)	2.6937	4.668	40.715	
16(3,13) - 15(2,14)		593963.141(93)	3.1523	3.573	82.937	
44(15,29) - 45(14,32)		594966.023(1612)	3.4210	5.164	993.420	
49(16,34) - 50(15,35)		596251.680(2113)	3.4042	5.932	1195.500	
44(2,42) - 45(1,45)		596252.672(3387)	5.2473	0.077	620.141	
13(9, 5) - 14(8, 6)		596465.039(354)	3.8778	0.543	176.038	
54(17,37) - 55(16,40)		597102.688(2751)	3.3744	6.701	1416.774	
59(18,42) - 60(17,43)		597532.086(3559)	3.4386	6.720	1657.205	
7(3, 5) - 6(0, 6)		597601.141(34)	5.4033	0.009	13.313	
44(7,37) - 44(6,38)		598535.102(1225)	2.7114	25.988	698.521	
18(10, 8) - 19(9,11)		600700.813(462)	3.6619	1.198	259.187	
27(3,25) - 26(2,24)		600935.977(166)	2.8945	10.411	236.696	
13(4,10) - 12(3, 9)		604367.461(67)	2.9090	4.859	65.306	
23(11,13) - 24(10,14)		604406.781(593)	3.5544	1.913	361.671	
60(7,53) - 59(8,52)		605118.352(1223)	3.2676	9.500	1245.298	
34(0,34) - 33(1,33)		606704.156(219)	2.5079	30.911	338.653	
37(2,36) - 37(1,37)		606894.328(711)	3.2661	5.858	423.122	
28(12,16) - 29(11,19)		607592.250(762)	3.4889	2.656	483.478	
33(2,32) - 32(1,31)		609558.836(185)	2.6065	23.580	336.198	
33(13,21) - 34(12,22)		610271.531(987)	3.4445	3.413	624.591	
53(4,50) - 54(1,53)		610658.070(5119)	4.8654	0.206	916.786	
51(6,46) - 51(5,47)		611659.641(2239)	2.7072	28.453	893.209	
38(14,24) - 39(13,27)		612460.430(1290)	3.4125	4.177	784.988	
8(5, 3) - 7(4, 4)		613076.328(33)	2.6942	4.806	45.185	
41(3,39) - 41(2,40)		613675.547(520)	2.9938	11.736	539.568	
42(7,35) - 42(6,36)		614115.320(962)	2.6863	24.349	641.914	
43(15,29) - 44(14,30)		614174.664(1690)	3.3884	4.946	964.644	
48(16,32) - 49(15,35)		615429.289(2208)	3.3704	5.714	1163.530	
12(9, 3) - 13(8, 6)		615628.586(368)	3.9469	0.390	167.095	
45(4,42) - 45(3,43)		616100.547(725)	2.8515	17.648	667.972	
53(17,37) - 54(16,38)		616238.531(2865)	3.3425	6.483	1381.614	
29(3,27) - 28(2,26)		616472.422(177)	2.8217	12.232	272.311	
46(3,43) - 46(2,44)		616526.227(710)	2.8581	17.726	696.368	
58(18,40) - 59(17,43)		616615.891(3693)	3.3977	6.582	1618.860	
45(3,43) - 46(0,46)		616765.758(3907)	5.2238	0.075	647.399	
34(2,32) - 33(3,31)		618152.516(180)	2.7353	17.310	372.404	
58(8,50) - 58(7,51)		619458.148(5364)	2.6339	36.846	1187.315	
49(5,45) - 49(4,46)		619798.430(1448)	2.7561	23.489	808.146	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
17(10, 8) - 18(9, 9)		619888.219(485)	3.6699	1.012	247.045	
58(5,53) - 58(4,54)		621621.781(2729)	2.7113	30.498	1136.818	
34(1,33) - 33(2,32)		622827.945(196)	2.5729	24.600	356.530	
29(6,24) - 30(3,27)		623176.102(260)	5.1189	0.060	319.048	
22(11,11) - 23(10,14)		623613.781(626)	3.5428	1.713	346.329	
38(1,37) - 38(0,38)		624105.547(837)	3.2408	5.861	445.701	
35(1,35) - 34(0,34)		624345.406(248)	2.4690	31.916	358.891	
42(4,38) - 41(5,37)		624888.281(315)	3.0431	10.161	595.623	
54(3,51) - 55(2,54)		625822.359(5905)	4.8508	0.202	949.887	
14(4,10) - 13(3,11)		626087.344(79)	2.8822	4.993	73.551	
40(7,33) - 40(6,34)		626169.625(744)	2.6683	22.811	588.068	
54(6,48) - 53(7,47)		626491.859(851)	3.1914	9.190	1002.651	
27(12,16) - 28(11,17)		626811.164(805)	3.4683	2.448	464.936	
16(2,14) - 15(1,15)		627331.164(79)	3.7146	0.831	74.663	
42(2,40) - 42(1,41)		627714.156(612)	2.9742	11.748	565.074	
52(4,48) - 52(3,49)		628011.992(1474)	2.7570	23.897	903.859	
32(13,19) - 33(12,22)		629492.820(1041)	3.4189	3.200	602.849	
37(14,24) - 38(13,25)		631673.609(1356)	3.3838	3.961	760.048	
9(5, 5) - 8(4, 4)		632193.445(35)	2.6889	4.959	50.295	
42(15,27) - 43(14,30)		633368.922(1770)	3.3578	4.728	936.507	
46(2,44) - 47(1,47)		633376.438(4508)	5.2089	0.073	675.241	
47(7,41) - 47(6,42)		633794.219(1788)	2.6377	27.683	786.097	
53(6,48) - 53(5,49)		633853.469(2669)	2.6702	28.921	959.988	
45(7,39) - 45(6,40)		634278.633(1427)	2.6407	26.275	726.150	
47(16,32) - 48(15,33)		634593.820(2305)	3.3383	5.496	1132.199	
11(9, 3) - 12(8, 4)		634782.289(382)	4.0577	0.254	158.791	
31(3,29) - 30(2,28)		634898.672(193)	2.7456	14.245	310.258	
49(7,43) - 49(6,44)		635130.320(2207)	2.6320	29.043	848.592	
38(7,31) - 38(6,32)		635325.914(568)	2.6563	21.343	536.946	
52(17,35) - 53(16,38)		635362.797(2982)	3.3118	6.265	1347.092	
57(18,40) - 58(17,41)		635689.734(3831)	3.3587	6.438	1581.151	
48(5,43) - 47(6,42)		636087.320(550)	3.1112	9.399	786.097	
43(7,37) - 43(6,38)		636091.914(1122)	2.6418	24.844	668.771	
5(4, 2) - 6(1, 5)		637674.445(39)	7.5288	0.000	15.614	
51(7,45) - 51(6,46)		638770.586(2688)	2.6230	30.326	913.611	
41(7,35) - 41(6,36)		638771.875(868)	2.6417	23.410	613.974	
16(10, 6) - 17(9, 9)		639062.969(508)	3.6887	0.834	235.543	
15(4,12) - 14(3,11)		639651.008(90)	2.8683	5.168	82.698	
39(7,33) - 40(4,36)		639772.617(1081)	4.8864	0.126	561.844	
9(3, 7) - 8(0, 8)		641206.586(44)	4.9192	0.028	22.727	
36(0,36) - 35(1,35)		641826.453(284)	2.4317	32.920	379.717	
39(7,33) - 39(6,34)		641915.727(662)	2.6411	21.988	561.772	
36(7,29) - 36(6,30)		642232.844(429)	2.6489	19.926	488.515	
39(2,38) 39(1,39)		642436.758(979)	3.2141	5.863	468.867	
21(11,11) - 22(10,12)		642806.508(658)	3.5365	1.516	331.628	
35(2,34) - 34(1,33)		643658.852(227)	2.5245	25.634	377.306	
53(7,47) - 53(6,48)		645150.961(3231)	2.6101	31.503	981.132	
37(7,31) - 37(6,32)		645198.992(499)	2.6404	20.588	512.173	
26(12,14) - 27(11,17)		646015.125(848)	3.4511	2.242	447.035	
49(8,42) - 50(5,45)		646049.734(3904)	4.7378	0.216	872.576	
56(8,48) - 56(7,49)		646924.977(4582)	2.5898	34.581	1111.967	
55(4,52) - 56(1,55)		647340.906(6728)	4.8243	0.198	983.571	
34(7,27) - 34(6,28)		647449.180(324)	2.6450	18.550	442.748	
35(7,29) - 35(6,30)		648382.234(375)	2.6402	19.214	465.180	
31(13,19) - 32(12,20)		648699.172(1095)	3.3959	2.988	581.748	
38(3,35) - 37(4,34)		649052.828(245)	2.8277	13.490	477.832	
43(3,41) - 43(2,42)		649234.922(732)	2.9404	11.748	591.178	

TABLE 4. Measured and calculated microwave spectrum of $^{34}SO_2$ in the vibrational ground state (MHz)

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
23(4,20) - 22(5,17)		3093.065(29)	10.1711	3.472	202.801	
12(2,10) - 11(3, 9)		5433.932(43)	9.4275	1.882	56.942	
33(6,28) - 32(7,25)		6391.114(42)	9.2187	5.025	417.904	
21(5,17) - 22(4,18)		6991.308(40)	9.0861	3.312	188.460	
38(7,31) - 37(8,30)		7456.001(50)	9.0169	5.793	554.279	
12(2,10) - 13(1,13)		7911.733(60)	9.3527	0.724	56.859	
26(3,23) - 27(2,26)		8283.146(486)	9.5810	0.796	242.885	
10(2, 8) - 11(1,11)	9650.630(50)	9650.699(52)	8.9428	0.859	41.754	[59A]
1(1, 1) - 2(0, 2)	10547.910(50)	10547.866(9)	8.1965	0.524	1.908	[59A]
28(5,23) - 27(6,22)	11695.050(100)	11695.115(49)	8.4309	4.268	300.729	[64D]
31(7,25) - 32(6,26)	12567.300(100)	12567.309(47)	8.3244	4.831	396.987	[64D]
15(2,14) - 14(3,11)	13184.800(50)	13184.867(34)	8.3449	1.969	82.074	[62B]
12(3, 9) - 13(2,12)	13207.900(100)	13207.994(33)	8.2881	1.800	64.256	[62B]
36(8,28) - 37(7,31)	14547.100(50)	14547.143(42)	8.1341	5.593	530.102	[62B]
41(9,33) - 42(8,34)	14583.050(50)	14583.041(56)	8.1307	6.357	682.469	[62B]
19(3,17) - 18(4,14)	14754.700(50)	14754.734(35)	8.1432	2.815	135.665	[62B]
26(6,20) - 27(5,23)	14850.400(50)	14850.416(29)	8.1078	4.061	282.945	[62B]
14(2,12) - 15(1,15)	15994.100(100)	15994.034(82)	8.6080	0.564	74.335	[64D]
37(3,35) - 36(4,32)		17056.070(5382)	8.6339	1.124	459.087	
5(2, 4) - 6(1, 5)	17970.420(100)	17970.280(29)	7.8034	0.960	15.540	[54A]
25(2,24) - 24(3,21)	20260.800(100)	20260.776(162)	8.2860	1.019	209.521	[64D]
16(4,12) - 17(3,15)	20548.190(50)	20548.182(33)	7.6912	2.494	112.533	[65A]
8(2, 6) - 9(1, 9)	20699.260(50)	20699.240(43)	7.8354	0.902	29.033	[65A]
18(3,15) - 17(4,14)	23732.990(50)	23733.004(42)	7.5057	2.786	124.072	[65A]
15(4,12) - 16(3,13)	25171.040(50)	25171.034(36)	7.4240	2.357	102.117	[65A]
29(5,25) - 28(6,22)	26038.350(50)	26038.294(43)	7.3850	4.441	318.683	[63C]
49(9,41) - 48(10,38)	26505.400(50)	26505.429(81)	7.3590	7.517	915.286	[63C]
39(7,33) - 38(8,30)	27398.000(50)	27398.025(62)	7.3162	5.986	578.620	[63C]
44(8,36) - 43(9,35)	27657.150(50)	27657.107(67)	7.3036	6.753	737.375	[63C]
38(4,34) - 39(3,37)		30028.995(8788)	8.0010	0.918	507.552	
8(1, 7) - 7(2, 6)	30975.450(50)	30975.387(36)	7.0536	1.629	24.398	[65A]
34(6,28) - 33(7,27)	30977.380(50)	30977.359(54)	7.1563	5.225	439.043	[65A]
4(0, 4) - 3(1, 3)	31011.180(50)	31011.148(20)	6.7632	1.677	5.311	[65A]
25(6,20) - 26(5,21)	32272.340(50)	32272.387(44)	7.1013	3.867	265.713	[65A]
17(2,16) - 16(3,13)	33212.810(50)	33212.808(40)	7.1913	1.981	102.117	[65A]
16(2,14) - 17(1,17)	33672.100(100)	33672.134(133)	7.8170	0.425	94.171	[64D]
35(8,28) - 36(7,29)	34811.010(50)	34810.919(47)	7.0019	5.392	506.379	[65A]
30(7,23) - 31(6,26)	35126.560(50)	35126.522(39)	6.9908	4.627	376.388	[65A]
40(9,31) - 41(8,34)	35664.800(100)	35664.763(73)	6.9700	6.155	655.525	[64D]
45(10,36) - 46(9,37)	35905.600(100)	35905.728(131)	6.9608	6.919	823.858	[64D]
20(5,15) - 21(4,18)	36294.540(50)	36294.559(30)	6.9510	3.091	174.047	[65A]
23(2,22) - 22(3,19)	39024.100(100)	39024.152(93)	7.2941	1.293	178.569	[64D]
6(2, 4) - 7(1, 7)	39819.200(100)	39819.114(37)	6.9229	0.792	18.710	[64D]
24(4,20) - 23(5,19)	40652.420(50)	40652.450(44)	6.8018	3.712	217.518	[65A]
25(4,22) - 24(5,19)	41540.900(50)	41540.889(45)	6.7793	3.811	232.947	[64D]
9(3, 7) - 10(2, 8)	43619.910(100)	43619.980(41)	6.7219	1.399	42.076	[65A]
10(3, 7) - 11(2,10)	44226.240(100)	44226.224(36)	6.7157	1.505	48.472	[65A]
19(2,18) - 18(3,15)	45079.680(100)	45079.706(57)	6.8726	1.838	124.864	[65A]
28(3,25) - 29(2,28)		45354.083(1200)	7.4971	0.628	277.928	
21(3,19) - 20(4,16)	47002.340(100)	47002.342(46)	6.6417	3.045	160.735	[64C]
21(2,20) - 20(3,17)	47293.110(100)	47293.104(81)	6.9166	1.586	150.345	[64C]
35(6,30) - 34(7,27)		48233.143(88)	6.5769	5.404	460.841	
40(7,33) - 39(8,32)		50703.754(114)	6.5109	6.180	603.605	
19(5,15) - 20(4,16)		51519.468(38)	6.5007	2.899	160.735	
2(1, 1) - 2(0, 2)	51822.090(100)	51821.878(27)	5.6725	2.460	1.908	[65A]
29(7,23) - 30(6,24)		54852.158(72)	6.4152	4.424	356.527	

TABLE 4. Measured and calculated microwave spectrum of $^{34}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
24(6,18) - 25(5,21)		55664.204(49)	6.3981	3.658	248.934	
34(8,26) - 35(7,29)		56006.676(103)	6.3870	5.187	483.273	
39(9,31) - 40(8,32)		56179.108(145)	6.3820	5.951	629.245	
35(3,33) - 34(4,30)		56285.652(3134)	6.9617	1.399	412.230	
4(1, 3) - 4(0, 4)	57687.500(100)	57687.535(29)	5.5580	4.179	6.346	[65A]
14(4,10) - 15(3,13)		57729.802(39)	6.3612	2.113	91.449	
30(5,25) - 29(6,24)		58010.599(57)	6.3355	4.653	337.260	
14(2,12) - 13(3,11)	58552.600(100)	58552.700(51)	6.2849	2.416	72.916	[65A]
18(2,16) - 19(1,19)		60157.378(232)	7.2343	0.320	116.359	
3(2, 2) - 4(1, 3)		64316.391(41)	6.3184	0.407	8.270	
4(2, 2) - 5(1, 5)		65375.044(42)	6.2970	0.524	10.798	
31(5,27) - 30(6,24)		66636.043(108)	6.1561	4.791	356.527	
1(1, 1) - 0(0, 0)		67750.312(37)	5.4925	1.000	0.000	
6(1, 5) - 6(0, 6)	67768.790(100)	67768.761(35)	5.3899	5.484	13.280	[63A]
13(4,10) - 14(3,11)		70255.509(43)	6.1148	1.925	82.074	
6(0, 6) - 5(1, 5)		74404.579(39)	5.5243	3.041	10.798	
23(6,18) - 24(5,19)		74580.810(76)	6.0240	3.452	232.947	
23(3,21) - 22(4,18)		74698.103(80)	6.0621	3.148	188.460	
18(5,13) - 19(4,16)		76031.277(52)	6.0048	2.682	147.769	
28(7,21) - 29(6,24)		76220.173(122)	5.9927	4.216	337.260	
36(6,30) - 35(7,29)		76252.551(158)	5.9766	5.601	483.273	
33(8,26) - 34(7,27)		76312.870(183)	5.9889	4.981	460.841	
38(9,29) - 39(8,32)		76866.718(273)	5.9779	5.744	603.605	
20(3,17) - 19(4,16)		77231.413(49)	5.9490	3.226	147.769	
27(4,24) - 26(5,21)		78195.127(102)	5.9576	4.087	265.713	
8(3, 5) - 9(2, 8)		78397.033(50)	6.0037	1.127	35.180	
10(1, 9) - 9(2, 8)		82124.322(51)	5.6984	2.447	35.180	
8(1, 7) - 8(0, 8)		83043.782(45)	5.1842	6.258	22.662	
33(3,31) - 32(4,28)		85973.415(1738)	6.2890	1.745	368.051	
7(3, 5) - 8(2, 6)		88720.604(56)	5.8665	0.941	29.724	
30(3,27) - 31(2,30)		89307.017(2494)	6.7359	0.507	315.316	
37(6,32) - 36(7,29)		90196.736(264)	5.7574	5.759	506.379	
26(4,22) - 25(5,21)	92428.910(50)	92428.904(58)	5.7222	4.101	248.934	[78A]
17(5,13) - 18(4,14)	93852.100(50)	93852.133(67)	5.7413	2.474	135.665	[78A]
20(2,18) - 21(1,21)		94250.687(436)	6.8086	0.245	140.893	
2(2, 0) - 3(1, 3)		95810.425(56)	6.0569	0.161	5.311	
12(4, 8) - 13(3,11)		95922.864(60)	5.7303	1.698	72.916	
25(3,23) - 24(4,20)		96075.191(150)	5.7768	3.098	218.874	
22(6,16) - 23(5,19)		96193.946(113)	5.7013	3.239	217.518	
27(7,21) - 28(6,22)		96204.184(184)	5.6960	4.006	318.683	
32(8,24) - 33(7,27)		96987.908(291)	5.6821	4.771	439.043	
37(9,29) - 38(8,30)		97236.818(428)	5.6763	5.536	578.620	
3(1, 3) - 2(0, 2)		102031.906(54)	5.0225	2.016	1.908	
10(1, 9) - 10(0,10)		104391.649(58)	4.9604	6.516	34.437	
31(3,29) - 30(4,26)		104915.004(933)	5.9136	2.143	326.604	
33(5,29) - 32(6,26)		106374.179(270)	5.5465	5.096	396.987	
32(5,27) - 31(6,26)		107567.672(176)	5.5255	5.020	376.388	
27(3,25) - 26(4,22)		109260.392(274)	5.6726	2.886	252.018	
29(4,26) - 28(5,23)		111902.713(229)	5.5018	4.273	301.119	
11(4, 8) - 12(3, 9)		112532.381(71)	5.5432	1.488	64.696	
29(3,27) - 28(4,24)		112577.881(500)	5.7184	2.547	287.922	
6(3, 3) - 7(2, 6)		114574.468(71)	5.5933	0.710	24.398	
16(2,14) - 15(3,13)		115291.389(60)	5.3582	3.041	91.449	
21(6,16) - 22(5,17)		115722.278(152)	5.4703	3.026	202.801	
16(5,11) - 17(4,14)		115744.759(95)	5.4827	2.256	124.072	
26(7,19) - 27(6,22)		116859.899(260)	5.4502	3.793	300.729	

TABLE 4. Measured and calculated microwave spectrum of $^{34}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
31(8,24) - 32(7,25)		117202.021(410)	5.4416	4.560	417.904	
36(9,27) - 37(8,30)		117632.232(615)	5.4333	5.325	554.279	
8(0, 8) - 7(1, 7)		118478.550(56)	4.8491	4.662	18.710	
38(6,32) - 37(7,31)		123913.338(484)	5.3402	5.959	530.102	
12(2,10) - 12(1,11)		124496.497(65)	4.6216	9.975	52.970	
10(2, 8) - 10(1, 9)		124614.117(59)	4.6464	7.892	37.920	
8(2, 6) - 8(1, 7)		128668.824(59)	4.6487	5.772	25.432	
14(2,12) - 14(1,13)	129803.360(200)	129803.404(74)	4.5628	11.691	70.539	[64C]
5(3, 3) - 6(2, 4)		130584.350(82)	5.4983	0.505	20.038	
39(6,34) - 38(7,31)		131936.191(617)	5.2607	6.082	554.527	
12(1,11) - 12(0,12)	132114.040(200)	132113.982(74)	4.7361	6.414	48.564	[64C]
5(1, 5) - 4(0, 4)	133471.470(200)	133471.469(68)	4.6764	3.140	6.346	[64C]
22(2,20) - 23(1,23)		134417.297(863)	6.4863	0.195	167.768	
10(4, 6) - 11(3, 9)		134535.324(92)	5.3410	1.267	56.942	
15(5,11) - 16(4,12)		134703.395(119)	5.3015	2.040	113.219	
6(2, 4) - 6(1, 5)	134826.120(200)	134826.285(63)	4.6443	3.876	15.540	[64C]
12(1,11) - 11(2,10)	134873.840(200)	134873.779(65)	4.9774	3.459	48.472	[64C]
22(3,19) - 21(4,18)	135566.280(200)	135566.340(64)	5.1957	3.709	174.047	[65A]
20(6,14) - 21(5,17)		136343.836(202)	5.2682	2.810	188.693	
25(7,19) - 26(6,20)		136848.215(341)	5.2531	3.579	283.441	
30(8,22) - 31(7,25)		137521.031(547)	5.2401	4.346	397.406	
35(9,27) - 36(8,28)		137836.396(822)	5.2325	5.113	530.587	
32(3,29) - 33(2,32)		138205.479(4616)	6.2731	0.423	355.043	
4(2, 2) - 4(1, 3)	141158.760(200)	141158.977(72)	4.6538	2.288	8.270	[64C]
31(4,28) - 30(5,25)		141195.699(461)	5.2209	4.335	339.195	
16(2,14) - 16(1,15)	141653.160(200)	141653.424(82)	4.4659	12.795	90.569	[64C]
35(5,31) - 34(6,28)		144436.498(572)	5.1529	5.339	440.076	
2(2, 0) - 2(1, 1)		146020.453(80)	4.7728	0.873	3.637	
28(4,24) - 27(5,23)		149209.852(152)	5.0899	4.496	282.945	
4(3, 1) - 5(2, 4)		151917.605(97)	5.4361	0.303	16.140	
9(4, 6) - 10(3, 7)		152953.730(109)	5.2110	1.052	49.947	
3(2, 2) - 3(1, 3)		153015.074(80)	4.6402	1.441	5.311	
14(5, 9) - 15(4,12)		155233.016(151)	5.1371	1.821	102.956	
19(6,14) - 20(5,15)		156033.668(251)	5.1056	2.593	175.258	
24(7,17) - 25(6,20)		157059.027(431)	5.0833	3.363	266.789	
29(8,22) - 30(7,23)		157588.678(693)	5.0702	4.131	377.560	
34(9,25) - 35(8,28)		158002.533(1051)	5.0607	4.899	507.540	
39(10,30) - 40(9,31)		158173.225(1510)	5.0549	5.666	656.715	
5(2, 4) - 5(1, 5)		160143.619(76)	4.5468	2.450	10.798	
18(2,16) - 18(1,17)		160802.615(91)	4.3363	13.219	113.002	
34(5,29) - 33(6,28)		161392.291(482)	4.9932	5.373	418.117	
10(0,10) - 9(1, 9)		162020.389(71)	4.3873	6.521	29.033	
7(1, 7) - 6(0, 6)		162775.932(80)	4.4006	4.455	13.280	
33(4,30) - 32(5,27)		164323.381(864)	5.0590	4.246	379.976	
14(1,13) - 14(0,14)		165620.654(100)	4.5231	6.167	65.014	
3(3, 1) - 4(2, 2)		170284.869(109)	5.5562	0.127	12.979	
7(2, 6) - 7(1, 7)		170546.945(75)	4.4720	3.286	18.710	
8(4, 4) - 9(3, 7)		173207.393(130)	5.0996	0.838	43.531	
13(5, 9) - 14(4,10)		174576.623(181)	5.0083	1.604	93.374	
40(6,34) - 39(7,33)		174817.457(1130)	4.8898	6.297	579.534	
18(2,16) - 17(3,15)		174850.270(73)	4.7678	3.807	112.533	
18(6,12) - 19(5,15)		176093.621(307)	4.9634	2.375	162.454	
23(7,17) - 24(6,18)		176940.695(525)	4.9389	3.146	250.791	
28(8,20) - 29(7,23)		177647.709(850)	4.9225	3.915	358.357	
33(9,25) - 34(8,26)		178041.316(1294)	4.9119	4.684	485.141	
38(10,28) - 39(9,31)		178238.473(1871)	4.9049	5.452	631.119	

TABLE 4. Measured and calculated microwave spectrum of $^{34}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
39(4,36) - 38(5,33)		178419.410(4583)	5.1596	3.102	518.907	
24(2,22) - 25(1,25)		178845.689(1674)	6.2338	0.161	196.982	
35(4,32) - 34(5,29)		179375.766(1552)	4.9968	3.993	423.500	
37(5,33) - 36(6,30)		179720.934(1079)	4.8795	5.494	485.817	
9(2, 8) - 9(1, 9)		184287.715(81)	4.3919	3.967	29.033	
37(4,34) - 36(5,31)		184534.256(2708)	5.0293	3.593	469.804	
2(2, 0) - 1(1, 1)		187294.465(101)	4.2203	1.476	2.260	
20(2,18) - 20(1,19)		187475.240(101)	4.1851	13.093	137.783	
14(1,13) - 13(2,12)		188366.523(81)	4.4720	4.716	64.256	
20(3,17) - 20(2,18)	189123.890(100)	189123.838(105)	4.0956	15.669	144.037	[74A]
22(3,19) - 22(2,20)		189392.482(108)	4.0791	17.787	172.252	
34(3,31) - 35(2,34)		189943.760(7860)	5.9488	0.365	397.107	
9(1, 9) - 8(0, 8)	191013.390(100)	191013.365(89)	4.1649	6.008	22.662	[74A]
7(4, 4) - 8(3, 5)		192254.877(149)	5.0326	0.631	37.795	
12(5, 7) - 13(4,10)		194416.834(215)	4.8978	1.387	84.417	
18(3,15) - 18(2,16)	194812.060(100)	194812.086(119)	4.0854	13.245	118.366	[74A]
17(6,12) - 18(5,13)		195742.453(363)	4.8433	2.156	150.305	
22(7,15) - 23(6,18)		196854.977(624)	4.8123	2.928	235.435	
24(3,21) - 24(2,22)	197044.300(100)	197044.303(164)	4.0295	19.278	202.948	[74A]
27(8,20) - 28(7,21)		197556.127(1014)	4.7933	3.698	339.802	
32(9,23) - 33(8,26)		198019.504(1552)	4.7807	4.468	463.387	
37(10,28) - 38(9,29)		198217.990(2254)	4.7726	5.236	606.169	
24(3,21) - 23(4,20)	198348.540(100)	198348.557(111)	4.6749	4.277	202.904	[74A]
11(2,10) - 11(1,11)		201376.451(97)	4.3048	4.498	41.754	
3(2, 2) - 2(1, 1)	203225.140(100)	203225.102(106)	4.2074	1.667	3.637	[74A]
16(1,15) - 16(0,16)		203504.143(141)	4.3277	5.932	83.781	
12(0,12) - 11(1,11)		204136.246(87)	4.0448	8.540	41.754	
16(3,13) - 16(2,14)		204525.227(127)	4.0584	10.861	95.294	
39(5,35) - 38(6,32)		210817.635(1905)	4.6911	5.533	534.235	
30(4,26) - 29(5,25)		211418.557(371)	4.6258	4.924	319.551	
6(4, 2) - 7(3, 5)		211762.877(169)	5.0073	0.434	32.683	
26(3,23) - 26(2,24)		212981.438(280)	3.9467	19.982	236.057	
11(5, 7) - 12(4, 8)		213807.545(247)	4.8107	1.172	76.115	
16(6,10) - 17(5,13)		215468.510(421)	4.7390	1.938	138.796	
14(3,11) - 14(2,12)		215999.777(124)	4.0251	8.750	74.869	
21(7,15) - 22(6,16)		216594.080(725)	4.7017	2.709	220.727	
26(8,18) - 27(7,21)		217413.889(1185)	4.6788	3.480	321.892	
31(9,23) - 32(8,24)		217903.891(1821)	4.6641	4.251	442.278	
36(10,26) - 37(9,29)		218131.635(2656)	4.6544	5.020	581.864	
11(1,11) - 10(0,10)		219355.066(101)	3.9548	7.790	34.437	
36(5,31) - 35(6,30)		220450.609(1066)	4.5839	5.724	462.450	
22(2,20) - 22(1,21)		221114.984(117)	4.0248	12.669	164.876	
13(2,12) - 13(1,13)		221735.674(122)	4.2125	4.892	56.859	
26(2,24) - 27(1,27)		225582.006(3070)	6.0316	0.138	228.533	
12(3, 9) - 12(2,10)		227031.936(112)	3.9941	6.976	57.123	
4(2, 2) - 3(1, 3)		229857.660(114)	4.1463	1.705	5.311	
5(4, 2) - 6(3, 3)		230933.484(187)	5.0550	0.253	28.220	
10(5, 5) - 11(4, 8)		233296.637(281)	4.7434	0.962	68.450	
15(6,10) - 16(5,11)		235004.430(480)	4.6503	1.721	127.933	
5(2, 4) - 4(1, 3)		235927.553(114)	4.1036	2.126	8.270	
10(3, 7) - 10(2, 8)		235951.977(100)	3.9731	5.479	42.076	
20(2,18) - 19(3,17)		236225.133(94)	4.3229	4.765	136.157	
20(7,13) - 21(6,16)		236296.377(830)	4.6041	2.491	206.661	
25(8,18) - 26(7,19)		237170.236(1359)	4.5770	3.262	304.627	
28(3,25) - 28(2,26)		237521.217(486)	3.8367	19.961	271.518	
30(9,21) - 31(8,24)		237723.604(2099)	4.5595	4.033	421.813	

TABLE 4. Measured and calculated microwave spectrum of $^{34}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
35(10,26) - 36(9,27)		237973.779(3074)	4.5482	4.803	558.202	
16(1,15) - 15(2,14)		241509.053(102)	4.0818	6.251	82.513	
8(3, 5) - 8(2, 6)		241985.508(99)	3.9687	4.154	29.724	
18(1,17) - 18(0,18)		243935.881(209)	4.1530	5.774	104.865	
14(0,14) - 13(1,13)		244481.543(109)	3.7793	10.627	56.859	
15(2,14) - 15(1,15)		245178.680(155)	4.1176	5.169	74.335	
6(3, 3) - 6(2, 4)		245302.299(111)	3.9903	2.902	20.038	
4(3, 1) - 4(2, 2)		246686.182(128)	4.0777	1.615	12.979	
3(3, 1) - 3(2, 2)		247127.455(136)	4.2240	0.892	10.416	
5(3, 3) - 5(2, 4)		247440.355(120)	4.0141	2.265	16.140	
7(3, 5) - 7(2, 6)		248364.816(105)	3.9568	3.484	24.398	
13(1,13) - 12(0,12)		248698.748(117)	3.7642	9.732	48.564	
30(4,26) - 30(3,27)		249099.816(1139)	3.7301	23.670	318.295	
4(4, 0) - 5(3, 3)		250156.182(204)	5.2611	0.102	24.394	
9(3, 7) - 9(2, 8)		250358.420(98)	3.9232	4.655	35.180	
32(4,28) - 32(3,29)		251758.973(1498)	3.7098	25.600	359.653	
9(5, 5) - 10(4, 6)		252615.629(313)	4.7000	0.758	61.430	
11(3, 9) - 11(2,10)		253936.346(106)	3.8930	5.790	48.472	
28(4,24) - 28(3,25)		254278.109(831)	3.7224	21.164	279.441	
14(6, 8) - 15(5,11)		254517.240(539)	4.5754	1.506	117.712	
19(7,13) - 20(6,14)		255893.082(935)	4.5184	2.273	193.241	
24(8,16) - 25(7,19)		256865.617(1538)	4.4858	3.043	288.005	
29(9,21) - 30(8,22)		257468.777(2383)	4.4653	3.814	401.993	
39(11,29) - 40(10,30)		257745.744(4931)	4.4432	5.356	687.560	
34(10,24) - 35(9,27)		257754.443(3505)	4.4519	4.585	535.185	
13(3,11) - 13(2,12)		259617.227(124)	3.8597	6.866	64.256	
24(2,22) - 24(1,23)		260327.004(215)	3.8657	12.193	194.264	
34(4,30) - 34(3,31)		263436.520(1975)	3.6584	26.698	403.443	
26(3,23) - 25(4,22)		264682.879(220)	4.2669	4.981	234.333	
26(4,22) - 26(3,23)		265488.996(567)	3.6940	18.458	243.162	
7(2, 6) - 6(1, 5)		265554.117(123)	3.9837	2.679	15.540	
15(3,13) - 15(2,14)		267871.090(143)	3.8205	7.855	82.513	
30(3,27) - 30(2,28)		270229.680(868)	3.7092	19.458	309.281	
17(2,16) - 17(1,17)		271410.168(199)	4.0224	5.356	94.171	
8(5, 3) - 9(4, 6)		271917.105(345)	4.6852	0.562	55.049	
28(2,26) - 29(1,29)		272787.563(5291)	5.8682	0.123	262.419	
13(6, 8) - 14(5, 9)		273930.496(598)	4.5145	1.294	108.134	
18(7,11) - 19(6,14)		275435.098(1040)	4.4433	2.056	180.463	
23(8,16) - 24(7,17)		276485.449(1718)	4.4042	2.825	272.028	
6(2, 4) - 5(1, 5)		276999.625(127)	4.0285	1.845	10.798	
28(9,19) - 29(8,22)		277152.902(2673)	4.3800	3.596	382.816	
33(10,24) - 34(9,25)		277473.699(3946)	4.3642	4.367	512.811	
38(11,27) - 39(10,30)		277481.566(5572)	4.3540	5.138	661.991	
32(4,28) - 31(5,27)		278834.559(772)	4.2503	5.429	358.750	
17(3,15) - 17(2,16)		279075.301(155)	3.7743	8.724	103.224	
15(1,15) - 14(0,14)		279430.023(138)	3.5904	11.755	65.014	
24(4,20) - 24(3,21)		280408.066(357)	3.6537	15.889	209.521	
16(0,16) - 15(1,15)		283183.590(136)	3.5659	12.721	74.335	
36(4,32) - 36(3,33)		284657.035(2734)	3.5783	26.925	449.592	
20(1,19) - 20(0,20)		285178.578(352)	4.0003	5.692	128.271	
38(5,33) - 37(6,32)		285362.164(2059)	4.2432	6.099	509.388	
7(5, 3) - 8(4, 4)		291146.281(374)	4.7119	0.380	49.309	
9(2, 8) - 8(1, 7)		292257.301(136)	3.8665	3.335	25.432	
18(1,17) - 17(2,16)		293122.953(125)	3.7689	8.059	103.224	
12(6, 6) - 13(5, 9)		293297.547(656)	4.4681	1.086	99.198	
19(3,17) - 19(2,18)		293481.773(157)	3.7208	9.453	126.368	

TABLE 4. Measured and calculated microwave spectrum of $^{34}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
17(7,11) - 18(6,12)		294904.855(1145)	4.3782	1.840	168.328	
22(8,14) - 23(7,17)		296046.852(1899)	4.3311	2.607	256.693	
22(4,18) - 22(3,19)		296499.738(218)	3.6101	13.647	178.569	
27(9,19) - 28(8,20)		296775.137(2966)	4.3026	3.377	364.283	
32(10,22) - 33(9,25)		297137.414(4395)	4.2842	4.148	491.080	
37(11,27) - 38(10,28)		297164.648(6228)	4.2721	4.920	637.065	
22(2,20) - 21(3,19)		298256.879(128)	3.9618	5.967	162.303	
19(2,18) - 19(1,19)		300049.172(285)	3.9291	5.477	116.359	
26(2,24) - 26(1,25)		303139.707(517)	3.7151	11.815	225.946	
3(3, 1) - 2(2, 0)		304332.105(160)	3.5069	2.490	8.507	
40(5,35) - 40(4,36)		307368.129(6139)	3.4527	31.686	560.555	
32(3,29) - 32(2,30)		309815.570(1559)	3.5742	18.776	349.319	
6(5, 1) - 7(4, 4)		310341.215(401)	4.8091	0.217	44.208	
38(5,33) - 38(4,34)		310378.410(5300)	3.4520	29.296	508.554	
21(3,19) - 21(2,20)		311196.672(162)	3.6610	10.034	151.923	
17(1,17) - 16(0,16)		311485.434(162)	3.4319	13.803	83.781	
20(4,16) - 20(3,17)		311487.434(164)	3.5702	11.757	150.345	
11(6, 6) - 12(5, 7)		312603.879(711)	4.4382	0.884	90.902	
16(7, 9) - 17(6,12)		314321.785(1250)	4.3230	1.627	156.835	
38(4,34) - 38(3,35)		315191.957(4032)	3.4761	26.473	498.040	
21(8,14) - 22(7,15)		315548.355(2080)	4.2660	2.390	242.001	
11(2,10) - 10(1, 9)		316339.871(154)	3.7537	4.126	37.920	
26(9,17) - 27(8,20)		316342.723(3261)	4.2323	3.159	346.392	
31(10,22) - 32(9,23)		316747.734(4849)	4.2109	3.930	469.992	
36(11,25) - 37(10,28)		316798.445(6895)	4.1968	4.701	612.781	
30(2,28) - 31(1,31)		319051.801(8619)	5.7362	0.111	298.638	
18(0,18) - 17(1,17)		320597.242(163)	3.3882	14.798	94.171	
36(5,31) - 36(4,32)		321283.906(4453)	3.4283	26.444	459.087	
4(3, 1) - 3(2, 2)		323528.770(161)	3.5188	2.593	10.416	
18(4,14) - 18(3,15)		323806.746(162)	3.5391	10.146	124.864	
22(1,21) - 22(0,22)		325997.445(655)	3.8689	5.660	154.002	
5(5, 1) - 6(4, 2)		329499.699(425)	5.0683	0.085	39.747	
8(2, 6) - 7(1, 7)		330191.156(144)	3.9260	1.804	18.710	
21(2,20) - 21(1,21)		330667.629(488)	3.8389	5.552	140.893	
10(6, 4) - 11(5, 7)		331867.445(765)	4.4285	0.690	83.247	
23(3,21) 23(2,22)		332173.691(240)	3.5960	10.474	179.871	
16(4,12) - 16(3,13)		332836.289(159)	3.5195	8.716	102.117	
28(3,25) - 27(4,24)		333363.965(439)	3.9262	5.875	268.321	
15(7, 9) - 16(6,10)		333685.035(1351)	4.2780	1.417	145.983	
20(8,12) - 21(7,15)		334998.453(2259)	4.2084	2.174	227.952	
25(9,17) - 26(8,18)		335857.938(3556)	4.1687	2.941	329.144	
30(10,20) - 31(9,23)		336308.762(5307)	4.1437	3.711	449.546	
35(11,25) - 36(10,26)		336385.414(7571)	4.1273	4.482	589.140	
34(5,29) - 34(4,30)		337874.457(3583)	3.3890	23.528	412.230	
13(2,12) - 12(1,11)		338320.438(176)	3.6439	5.100	52.970	
14(4,10) - 14(3,11)		338785.758(144)	3.5118	7.394	82.074	
5(3, 3) - 4(2, 2)		342208.934(160)	3.5086	2.742	12.979	
20(1,19) - 19(2,18)		342231.668(143)	3.5146	10.077	126.368	
12(4, 8) - 12(3, 9)		342332.098(126)	3.5150	6.133	64.696	
10(4, 6) - 10(3, 7)		344245.445(124)	3.5294	4.901	49.947	
19(1,19) - 18(0,18)		344581.117(185)	3.2872	15.850	104.865	
13(4,10) - 13(3,11)		344807.988(133)	3.4989	6.726	72.916	
15(4,12) - 15(3,13)		344987.648(151)	3.4853	7.956	91.449	
11(4, 8) - 11(3, 9)		344998.246(122)	3.5156	5.505	56.942	
8(4, 4) - 8(3, 5)		345168.781(146)	3.5601	3.667	37.795	
9(4, 6) - 9(3, 7)		345285.727(133)	3.5404	4.284	43.531	

TABLE 4. Measured and calculated microwave spectrum of $^{34}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
7(4, 4) - 7(3, 5)		345519.781(163)	3.5866	3.035	32.683	
6(4, 2) - 6(3, 3)		345553.223(181)	3.6297	2.381	28.220	
5(4, 2) - 5(3, 3)		345651.434(199)	3.7067	1.686	24.394	
4(4, 0) - 4(3, 1)		345678.934(215)	3.8841	0.917	21.207	
17(4,14) - 17(3,15)		345929.352(160)	3.4718	9.190	112.533	
28(2,26) - 28(1,27)		347482.758(1112)	3.5777	11.576	259.927	
19(4,16) - 19(3,17)		348117.555(157)	3.4564	10.412	136.157	

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz)

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
12(2,10) - 11(3, 9)	12.5	11.5	0.257	587.916(75)		57.236
12(2,10) - 11(3, 9)	11.5	10.5	0.237	588.398(73)		57.236
12(2,10) - 11(3, 9)	13.5	12.5	0.280	591.980(74)		57.236
12(2,10) - 11(3, 9)	10.5	9.5	0.217	592.462(75)		57.236
12(2,10) - 13(1,13)	12.5	13.5	0.257	8109.511(135)		56.985
12(2,10) - 13(1,13)	11.5	12.5	0.238	8110.941(131)		56.985
12(2,10) - 13(1,13)	13.5	14.5	0.278	8121.909(132)		56.985
12(2,10) - 13(1,13)	10.5	11.5	0.220	8123.339(135)		56.985
19(3,17) - 18(4,14)	17.5	16.5	0.230	9592.258(131)		136.205
19(3,17) - 18(4,14)	20.5	19.5	0.269	9592.326(131)		136.205
19(3,17) - 18(4,14)	18.5	17.5	0.242	9593.048(131)		136.205
19(3,17) - 18(4,14)	19.5	18.5	0.255	9593.116(131)		136.205
15(2,14) - 14(3,11)	13.5	12.5	0.224	10309.378(122)		82.376
15(2,14) - 14(3,11)	16.5	15.5	0.274	10309.753(121)		82.376
15(2,14) - 14(3,11)	14.5	13.5	0.240	10313.082(121)		82.376
15(2,14) - 14(3,11)	15.5	14.5	0.256	10313.457(122)		82.376
10(2, 8) 11(1,11)	10.5	11.5	0.258	10650.749(124)		41.852
10(2, 8) - 11(1,11)	9.5	10.5	0.235	10652.262(121)		41.852
10(2, 8) - 11(1,11)	11.5	12.5	0.283	10661.871(121)		41.852
10(2, 8) - 11(1,11)	8.5	9.5	0.214	10663.384(125)		41.852
1(1, 1) - 2(0, 2)	0.5	0.5	0.083	11368.097(37)		1.910
1(1, 1) - 2(0, 2)	0.5	1.5	0.083	11368.208(35)	11368.002(20)	1.910
1(1, 1) - 2(0, 2)	2.5	3.5	0.400	11373.255(28)	11373.286(20)	1.910
1(1, 1) - 2(0, 2)	2.5	2.5	0.090	11373.366(36)		1.910
1(1, 1) - 2(0, 2)	1.5	0.5	0.017	11379.523(40)		1.910
1(1, 1) - 2(0, 2)	1.5	1.5	0.107	11379.634(32)		1.910
1(1, 1) - 2(0, 2)	1.5	2.5	0.210	11379.714(47)	11379.825(20)	1.910
14(2,12) - 15(1,15)	14.5	15.5	0.256	15252.802(143)		74.495
14(2,12) - 15(1,15)	13.5	14.5	0.240	15254.140(139)		74.495
14(2,12) - 15(1,15)	15.5	16.5	0.274	15266.180(140)	15266.20(10)	74.495
14(2,12) - 15(1,15)	12.5	13.5	0.224	15267.518(143)	15267.50(10)	74.495
12(3, 9) - 13(2,12)	12.5	13.5	0.257	16634.691(114)		64.436
12(3, 9) - 13(2,12)	11.5	12.5	0.238	16635.002(113)		64.436
12(3, 9) - 13(2,12)	13.5	14.5	0.278	16637.338(113)		64.436
12(3, 9) - 13(2,12)	10.5	11.5	0.220	16637.648(114)		64.436
18(3,15) - 17(4,14)	18.5	17.5	0.256	16758.395(88)		124.610
18(3,15) - 17(4,14)	17.5	16.5	0.242	16758.608(87)		124.610
18(3,15) - 17(4,14)	19.5	18.5	0.270	16761.081(87)		124.610
18(3,15) - 17(4,14)	16.5	15.5	0.229	16761.293(88)		124.610
5(2, 4) - 6(1, 5)	4.5	4.5	0.010	20602.121(71)		15.576
5(2, 4) - 6(1, 5)	3.5	4.5	0.182	20602.187(59)	20602.10(10)	15.576
5(2, 4) - 6(1, 5)	6.5	7.5	0.308	20603.597(56)	20603.60(10)	15.576
5(2, 4) - 6(1, 5)	5.5	5.5	0.014	20608.147(56)		15.576
5(2, 4) - 6(1, 5)	4.5	5.5	0.217	20608.166(56)	20608.20(10)	15.576
5(2, 4) - 6(1, 5)	5.5	6.5	0.259	20609.576(59)	20609.60(10)	15.576
5(2, 4) - 6(1, 5)	6.5	6.5	0.010	20609.643(71)		15.576
8(2, 6) - 9(1, 9)	8.5	9.5	0.259	22314.650(101)	22314.75(5)	29.107
8(2, 6) - 9(1, 9)	7.5	8.5	0.231	22316.254(97)	22316.35(5)	29.107
8(2, 6) - 9(1, 9)	9.5	10.5	0.289	22324.342(98)	22324.40(10)	29.107
8(2, 6) - 9(1, 9)	6.5	7.5	0.206	22325.946(101)	22326.00(10)	29.107
16(4,12) - 17(3,15)	16.5	17.5	0.256	26037.157(106)		112.877
16(4,12) - 17(3,15)	15.5	16.5	0.241	26037.194(106)		112.877
16(4,12) - 17(3,15)	17.5	18.5	0.271	26037.507(106)		112.877
16(4,12) - 17(3,15)	14.5	15.5	0.227	26037.544(106)		112.877
8(1, 7) - 7(2, 6)	8.5	7.5	0.259	28269.073(74)	28269.10(5)	24.531
8(1, 7) - 7(2, 6)	7.5	6.5	0.227	28270.099(72)	28270.10(5)	24.531

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
8(1, 7) - 7(2, 6)	9.5	8.5	0.294	28274.793(72)	28274.85(5)	24.531
8(1, 7) - 7(2, 6)	6.5	5.5	0.200	28275.818(74)	28275.80(5)	24.531
4(0, 4) - 3(1, 3)	3.5	3.5	0.030	30190.169(66)		5.346
4(0, 4) - 3(1, 3)	4.5	3.5	0.255	30190.362(63)		5.346
4(0, 4) - 3(1, 3)	2.5	2.5	0.023	30192.435(78)		5.346
4(0, 4) - 3(1, 3)	3.5	2.5	0.191	30192.984(58)	30192.90(5)	5.346
4(0, 4) - 3(1, 3)	5.5	4.5	0.333	30195.844(59)	30195.85(5)	5.346
4(0, 4) - 3(1, 3)	4.5	4.5	0.023	30196.392(80)		5.346
4(0, 4) - 3(1, 3)	2.5	1.5	0.143	30198.466(64)	30198.45(5)	5.346
17(2,16) - 16(3,13)	15.5	14.5	0.227	31163.898(114)		102.422
17(2,16) - 16(3,13)	18.5	17.5	0.271	31164.338(113)		102.422
17(2,16) - 16(3,13)	16.5	15.5	0.241	31168.832(113)		102.422
17(2,16) - 16(3,13)	17.5	16.5	0.256	31169.272(114)		102.422
15(4,12) - 16(3,13)	13.5	14.5	0.226	31653.697(103)		102.422
15(4,12) - 16(3,13)	16.5	17.5	0.273	31653.875(103)		102.422
15(4,12) - 16(3,13)	14.5	15.5	0.240	31655.711(103)		102.422
15(4,12) - 16(3,13)	15.5	16.5	0.256	31655.889(103)		102.422
16(2,14) - 17(1,17)	16.5	17.5	0.256	31924.701(159)		94.371
16(2,14) - 17(1,17)	15.5	16.5	0.241	31925.936(156)		94.371
16(2,14) - 17(1,17)	17.5	18.5	0.271	31938.711(156)		94.371
16(2,14) - 17(1,17)	14.5	15.5	0.227	31939.947(159)		94.371
6(2, 4) - 7(1, 7)	6.5	7.5	0.259	41854.667(89)	41854.65(5)	18.766
6(2, 4) - 7(1, 7)	6.5	6.5	0.010	41855.979(85)		18.766
6(2, 4) - 7(1, 7)	5.5	6.5	0.223	41856.420(85)	41856.40(5)	18.766
6(2, 4) - 7(1, 7)	7.5	8.5	0.300	41862.973(85)	41862.95(5)	18.766
6(2, 4) - 7(1, 7)	4.5	5.5	0.192	41864.726(90)	41864.70(5)	18.766
19(2,18) - 18(3,15)	17.5	16.5	0.230	44168.053(136)	44168.20(10)	125.169
19(2,18) - 18(3,15)	20.5	19.5	0.269	44168.553(134)	44168.70(10)	125.169
19(2,18) - 18(3,15)	18.5	17.5	0.242	44174.323(134)	44174.50(10)	125.169
19(2,18) - 18(3,15)	19.5	18.5	0.255	44174.823(135)	44175.00(10)	125.169
10(3, 7) - 11(2,10)	10.5	11.5	0.258	48001.436(79)		48.632
10(3, 7) - 11(2,10)	9.5	10.5	0.235	48001.684(78)		48.632
10(3, 7) - 11(2,10)	11.5	12.5	0.283	48003.214(78)		48.632
10(3, 7) - 11(2,10)	8.5	9.5	0.214	48003.462(79)		48.632
9(3, 7) - 10(2, 8)	7.5	8.5	0.211	48174.395(124)	48174.50(10)	42.207
9(3, 7) - 10(2, 8)	10.5	11.5	0.286	48174.859(123)	48175.00(10)	42.207
9(3, 7) - 10(2, 8)	8.5	9.5	0.233	48177.695(123)	48177.80(10)	42.207
9(3, 7) - 10(2, 8)	9.5	10.5	0.258	48178.161(124)	48178.30(10)	42.207
2(1, 1) - 2(0, 2)	2.5	3.5	0.057	52643.144(97)		1.910
2(1, 1) - 2(0, 2)	2.5	1.5	0.070	52643.175(92)		1.910
2(1, 1) - 2(0, 2)	2.5	2.5	0.173	52643.254(95)	52643.30(10)	1.910
2(1, 1) - 2(0, 2)	1.5	0.5	0.050	52647.598(106)		1.910
2(1, 1) - 2(0, 2)	1.5	1.5	0.080	52647.709(80)	52647.75(10)	1.910
2(1, 1) - 2(0, 2)	1.5	2.5	0.070	52647.789(98)		1.910
2(1, 1) - 2(0, 2)	3.5	3.5	0.343	52649.491(86)	52649.60(10)	1.910
2(1, 1) - 2(0, 2)	3.5	2.5	0.057	52649.602(101)		1.910
2(1, 1) - 2(0, 2)	0.5	0.5	0.050	52653.946(102)	52653.90(10)	1.910
2(1, 1) - 2(0, 2)	0.5	1.5	0.050	52654.057(96)		1.910
14(2,12) - 13(3,11)	14.5	13.5	0.257	53385.082(133)	53385.10(10)	73.224
14(2,12) - 13(3,11)	13.5	12.5	0.239	53385.551(132)	53385.60(10)	73.224
14(2,12) - 13(3,11)	15.5	14.5	0.276	53389.667(132)	53389.70(10)	73.224
14(2,12) - 13(3,11)	12.5	11.5	0.222	53390.137(133)	53390.25(10)	73.224
18(2,16) - 19(1,19)	18.5	19.5	0.255	57410.009(218)	57410.00(10)	116.605
18(2,16) - 19(1,19)	17.5	18.5	0.242	57411.137(216)	57411.10(10)	116.605
18(2,16) - 19(1,19)	19.5	20.5	0.269	57424.316(216)	57424.35(10)	116.605
18(2,16) - 19(1,19)	16.5	17.5	0.230	57425.444(219)	57425.40(10)	116.605

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
4(1, 3) - 4(0, 4)	4.5	4.5	0.236	58425.519(105)	58425.40(10)	6.353
4(1, 3) - 4(0, 4)	4.5	3.5	0.024	58425.711(104)		6.353
4(1, 3) - 4(0, 4)	4.5	5.5	0.018	58426.067(116)		6.353
4(1, 3) - 4(0, 4)	3.5	4.5	0.024	58427.728(106)		6.353
4(1, 3) - 4(0, 4)	3.5	3.5	0.181	58427.920(98)	58427.80(10)	6.353
4(1, 3) - 4(0, 4)	3.5	2.5	0.018	58428.469(118)		6.353
4(1, 3) - 4(0, 4)	5.5	4.5	0.018	58431.818(118)		6.353
4(1, 3) - 4(0, 4)	5.5	5.5	0.315	58432.367(100)	58432.30(10)	6.353
4(1, 3) - 4(0, 4)	2.5	3.5	0.018	58434.219(116)		6.353
4(1, 3) - 4(0, 4)	2.5	2.5	0.149	58434.768(106)	58434.60(10)	6.353
19(5,15) - 20(4,16)	17.5	18.5	0.231	59442.081(232)		161.285
19(5,15) - 20(4,16)	20.5	21.5	0.268	59442.147(232)		161.285
19(5,15) - 20(4,16)	18.5	19.5	0.243	59443.044(232)		161.285
19(5,15) - 20(4,16)	19.5	20.5	0.255	59443.111(232)		161.285
14(4,10) - 15(3,13)	14.5	15.5	0.256	63401.287(152)		91.773
14(4,10) - 15(3,13)	13.5	14.5	0.240	63401.299(152)		91.773
14(4,10) - 15(3,13)	15.5	16.5	0.274	63401.334(152)		91.773
14(4,10) - 15(3,13)	12.5	13.5	0.224	63401.345(152)		91.773
3(2, 2) - 4(1, 3)	1.5	2.5	0.143	66895.463(137)		8.302
3(2, 2) - 4(1, 3)	2.5	2.5	0.023	66895.463(137)		8.302
3(2, 2) - 4(1, 3)	4.5	5.5	0.333	66897.671(129)		8.302
3(2, 2) - 4(1, 3)	3.5	3.5	0.030	66901.762(127)		8.302
3(2, 2) - 4(1, 3)	2.5	3.5	0.191	66901.762(127)		8.302
3(2, 2) - 4(1, 3)	3.5	4.5	0.255	66903.971(135)		8.302
3(2, 2) - 4(1, 3)	4.5	4.5	0.023	66903.971(135)		8.302
4(2, 2) - 5(1, 5)	4.5	5.5	0.258	67670.341(137)		10.841
4(2, 2) - 5(1, 5)	5.5	5.5	0.015	67671.266(145)		10.841
4(2, 2) - 5(1, 5)	4.5	4.5	0.020	67672.084(129)		10.841
4(2, 2) - 5(1, 5)	3.5	4.5	0.207	67672.408(131)		10.841
4(2, 2) - 5(1, 5)	5.5	6.5	0.318	67677.447(132)		10.841
4(2, 2) - 5(1, 5)	3.5	3.5	0.015	67678.590(145)		10.841
4(2, 2) - 5(1, 5)	2.5	3.5	0.167	67679.515(138)		10.841
6(1, 5) - 6(0, 6)	6.5	6.5	0.249	68341.854(150)		13.296
6(1, 5) - 6(0, 6)	6.5	5.5	0.012	68342.221(149)		13.296
6(1, 5) - 6(0, 6)	5.5	6.5	0.012	68343.282(151)		13.296
6(1, 5) - 6(0, 6)	5.5	5.5	0.210	68343.649(146)		13.296
6(1, 5) - 6(0, 6)	7.5	7.5	0.299	68349.452(147)		13.296
6(1, 5) - 6(0, 6)	4.5	4.5	0.184	68351.249(151)		13.296
1(1, 1) - 0(0, 0)	0.5	1.5	0.167	68628.012(127)		0.000
1(1, 1) - 0(0, 0)	2.5	1.5	0.500	68633.090(114)		0.000
1(1, 1) - 0(0, 0)	1.5	1.5	0.333	68639.438(124)		0.000
20(3,17) - 19(4,16)	20.5	19.5	0.255	69631.869(222)		148.324
20(3,17) - 19(4,16)	19.5	18.5	0.243	69632.109(222)		148.324
20(3,17) - 19(4,16)	21.5	20.5	0.268	69635.218(222)		148.324
20(3,17) - 19(4,16)	18.5	17.5	0.231	69635.458(223)		148.324
6(0, 6) - 5(1, 5)	5.5	5.5	0.014	73606.600(137)		10.841
6(0, 6) - 5(1, 5)	4.5	4.5	0.010	73606.789(154)		10.841
6(0, 6) - 5(1, 5)	6.5	5.5	0.259	73606.967(133)		10.841
6(0, 6) - 5(1, 5)	5.5	4.5	0.217	73608.343(130)		10.841
6(0, 6) - 5(1, 5)	7.5	6.5	0.308	73611.594(130)		10.841
6(0, 6) - 5(1, 5)	4.5	3.5	0.182	73612.971(134)		10.841
6(0, 6) - 5(1, 5)	6.5	6.5	0.010	73613.148(154)		10.841
13(4,10) - 14(3,11)	11.5	12.5	0.222	76412.045(333)		82.376
13(4,10) - 14(3,11)	14.5	15.5	0.276	76412.187(332)		82.376
13(4,10) - 14(3,11)	12.5	13.5	0.239	76413.471(332)		82.376
13(4,10) - 14(3,11)	13.5	14.5	0.257	76413.612(333)		82.376

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
10(1, 9) - 9(2, 8)	10.5	9.5	0.258	79356.295(167)		35.325
10(1, 9) - 9(2, 8)	9.5	8.5	0.233	79357.078(166)		35.325
10(1, 9) - 9(2, 8)	11.5	10.5	0.286	79361.693(166)		35.325
10(1, 9) - 9(2, 8)	8.5	7.5	0.211	79362.477(168)		35.325
8(3, 5) - 9(2, 8)	8.5	9.5	0.259	82379.888(219)		35.325
8(3, 5) - 9(2, 8)	7.5	8.5	0.231	82380.075(218)		35.325
8(3, 5) - 9(2, 8)	9.5	10.5	0.289	82380.972(218)		35.325
8(3, 5) - 9(2, 8)	6.5	7.5	0.206	82381.159(219)		35.325
8(1, 7) - 8(0, 8)	8.5	8.5	0.253	83340.753(243)		22.694
8(1, 7) - 8(0, 8)	7.5	7.5	0.223	83342.267(239)		22.694
8(1, 7) - 8(0, 8)	9.5	9.5	0.289	83349.215(240)		22.694
8(1, 7) - 8(0, 8)	6.5	6.5	0.201	83350.729(243)		22.694
18(5,13) - 19(4,16)	16.5	17.5	0.230	83540.086(412)		148.324
18(5,13) - 19(4,16)	19.5	20.5	0.269	83540.109(412)		148.324
18(5,13) - 19(4,16)	17.5	18.5	0.242	83540.439(412)		148.324
18(5,13) - 19(4,16)	18.5	19.5	0.255	83540.463(412)		148.324
7(3, 5) - 8(2, 6)	5.5	6.5	0.200	93070.574(326)		29.852
7(3, 5) - 8(2, 6)	8.5	9.5	0.294	93070.994(324)		29.852
7(3, 5) - 8(2, 6)	6.5	7.5	0.227	93072.991(324)		29.852
7(3, 5) - 8(2, 6)	7.5	8.5	0.259	93073.411(325)		29.852
2(2, 0) - 3(1, 3)	3.5	3.5	0.041	98257.746(210)		5.346
2(2, 0) - 3(1, 3)	2.5	3.5	0.245	98257.856(233)		5.346
2(2, 0) - 3(1, 3)	1.5	2.5	0.160	98260.592(203)		5.346
2(2, 0) - 3(1, 3)	2.5	2.5	0.052	98260.671(221)		5.346
2(2, 0) - 3(1, 3)	3.5	4.5	0.357	98263.776(213)		5.346
2(2, 0) - 3(1, 3)	0.5	1.5	0.100	98266.512(244)		5.346
2(2, 0) - 3(1, 3)	1.5	1.5	0.040	98266.622(219)		5.346
17(5,13) - 18(4,14)	15.5	16.5	0.229	101559.247(729)		136.205
17(5,13) - 18(4,14)	18.5	19.5	0.270	101559.301(729)		136.205
17(5,13) - 18(4,14)	16.5	17.5	0.242	101559.956(729)		136.205
17(5,13) - 18(4,14)	17.5	18.5	0.256	101560.010(729)		136.205
12(4, 8) - 13(3,11)	10.5	11.5	0.220	101688.420(502)		73.224
12(4, 8) - 13(3,11)	13.5	14.5	0.278	101688.429(501)		73.224
12(4, 8) - 13(3,11)	11.5	12.5	0.238	101688.564(501)		73.224
12(4, 8) - 13(3,11)	12.5	13.5	0.257	101688.573(502)		73.224
3(1, 3) - 2(0, 2)	1.5	0.5	0.100	102995.328(205)		1.910
3(1, 3) - 2(0, 2)	1.5	1.5	0.040	102995.439(213)		1.910
3(1, 3) - 2(0, 2)	4.5	3.5	0.357	102998.222(196)		1.910
3(1, 3) - 2(0, 2)	2.5	1.5	0.160	103001.470(197)		1.910
3(1, 3) - 2(0, 2)	2.5	2.5	0.052	103001.549(206)		1.910
3(1, 3) - 2(0, 2)	3.5	3.5	0.041	103004.252(216)		1.910
3(1, 3) - 2(0, 2)	3.5	2.5	0.245	103004.363(201)		1.910
10(1, 9) - 10(0,10)	10.5	10.5	0.254	104296.414(403)		34.493
10(1, 9) - 10(0,10)	9.5	9.5	0.230	104297.749(400)		34.493
10(1, 9) - 10(0,10)	11.5	11.5	0.282	104305.676(400)		34.493
10(1, 9) - 10(0,10)	8.5	8.5	0.211	104307.011(403)		34.493
16(2,14) - 15(3,13)	16.5	15.5	0.256	109825.287(427)		91.773
16(2,14) - 15(3,13)	15.5	14.5	0.240	109825.724(426)		91.773
16(2,14) - 15(3,13)	17.5	16.5	0.273	109830.127(426)		91.773
16(2,14) - 15(3,13)	14.5	13.5	0.226	109830.563(427)		91.773
8(0, 8) - 7(1, 7)	8.5	7.5	0.259	117756.400(276)		18.766
8(0, 8) - 7(1, 7)	7.5	6.5	0.227	117757.208(275)		18.766
8(0, 8) - 7(1, 7)	9.5	8.5	0.294	117760.023(275)		18.766
8(0, 8) - 7(1, 7)	6.5	5.5	0.200	117760.831(277)		18.766
11(4, 8) - 12(3, 9)	9.5	10.5	0.217	118505.406(763)		64.991
11(4, 8) - 12(3, 9)	12.5	13.5	0.280	118505.517(763)		64.991

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
11(4, 8) - 12(3, 9)	10.5	11.5	0.237	118506.378(763)		64.991
11(4, 8) - 12(3, 9)	11.5	12.5	0.257	118506.488(763)		64.991
6(3, 3) - 7(2, 6)	6.5	7.5	0.259	118677.245(460)		24.531
6(3, 3) - 7(2, 6)	6.5	6.5	0.010	118677.260(456)		24.531
6(3, 3) - 7(2, 6)	5.5	6.5	0.223	118677.365(458)		24.531
6(3, 3) - 7(2, 6)	7.5	8.5	0.300	118677.764(458)		24.531
6(3, 3) - 7(2, 6)	4.5	5.5	0.192	118677.885(460)		24.531
16(5,11) - 17(4,14)	14.5	15.5	0.227	123259.803(1076)		124.610
16(5,11) - 17(4,14)	17.5	18.5	0.271	123259.829(1076)		124.610
16(5,11) - 17(4,14)	15.5	16.5	0.241	123260.165(1076)		124.610
16(5,11) - 17(4,14)	16.5	17.5	0.256	123260.191(1076)		124.610
12(2,10) - 12(1,11)	12.5	12.5	0.254	126461.109(1121)		53.038
12(2,10) - 12(1,11)	11.5	11.5	0.234	126461.178(1120)		53.038
12(2,10) - 12(1,11)	13.5	13.5	0.278	126461.675(1120)		53.038
12(2,10) - 12(1,11)	10.5	10.5	0.218	126461.743(1121)		53.038
10(2, 8) - 10(1, 9)	8.5	8.5	0.211	126973.018(814)		37.972
10(2, 8) - 10(1, 9)	11.5	11.5	0.282	126973.174(814)		37.972
10(2, 8) - 10(1, 9)	9.5	9.5	0.230	126974.099(814)		37.972
10(2, 8) - 10(1, 9)	10.5	10.5	0.254	126974.255(814)		37.972
14(2,12) - 14(1,13)	14.5	14.5	0.254	131188.012(1676)		70.629
14(2,12) - 14(1,13)	13.5	13.5	0.237	131188.232(1676)		70.629
14(2,12) - 14(1,13)	15.5	15.5	0.274	131190.131(1676)		70.629
14(2,12) - 14(1,13)	12.5	12.5	0.222	131190.352(1676)		70.629
8(2, 6) - 8(1, 7)	6.5	6.5	0.201	131245.219(596)		25.474
8(2, 6) - 8(1, 7)	9.5	9.5	0.289	131245.705(595)		25.474
8(2, 6) - 8(1, 7)	7.5	7.5	0.223	131247.934(595)		25.474
8(2, 6) - 8(1, 7)	8.5	8.5	0.253	131248.418(596)		25.474
12(1,11) - 12(0,12)	12.5	12.5	0.254	131555.756(673)		48.649
12(1,11) - 12(0,12)	11.5	11.5	0.234	131556.938(670)		48.649
12(1,11) - 12(0,12)	13.5	13.5	0.278	131565.549(671)		48.649
12(1,11) - 12(0,12)	10.5	10.5	0.218	131566.730(673)		48.649
12(1,11) - 11(2,10)	12.5	11.5	0.257	132081.801(423)		48.632
12(1,11) - 11(2,10)	11.5	10.5	0.237	132082.406(421)		48.632
12(1,11) - 11(2,10)	13.5	12.5	0.280	132086.770(421)		48.632
12(1,11) - 11(2,10)	10.5	9.5	0.217	132087.377(423)		48.632
5(1, 5) - 4(0, 4)	3.5	3.5	0.015	134546.701(358)		6.353
5(1, 5) - 4(0, 4)	3.5	2.5	0.167	134547.250(339)		6.353
5(1, 5) - 4(0, 4)	6.5	5.5	0.318	134548.801(335)		6.353
5(1, 5) - 4(0, 4)	4.5	4.5	0.020	134552.689(339)		6.353
5(1, 5) - 4(0, 4)	4.5	3.5	0.207	134552.883(335)		6.353
5(1, 5) - 4(0, 4)	5.5	4.5	0.258	134554.434(338)		6.353
5(1, 5) - 4(0, 4)	5.5	5.5	0.015	134554.982(359)		6.353
5(3, 3) - 6(2, 4)	4.5	4.5	0.010	134829.059(588)		20.162
5(3, 3) - 6(2, 4)	3.5	4.5	0.182	134829.309(585)		20.162
5(3, 3) - 6(2, 4)	6.5	7.5	0.308	134829.680(582)		20.162
5(3, 3) - 6(2, 4)	5.5	5.5	0.014	134830.855(581)		20.162
5(3, 3) - 6(2, 4)	4.5	5.5	0.217	134830.926(581)		20.162
5(3, 3) - 6(2, 4)	5.5	6.5	0.259	134831.295(585)		20.162
5(3, 3) - 6(2, 4)	6.5	6.5	0.010	134831.545(587)		20.162
6(2, 4) - 6(1, 5)	4.5	4.5	0.184	137475.412(395)		15.576
6(2, 4) - 6(1, 5)	7.5	7.5	0.299	137476.400(392)		15.576
6(2, 4) - 6(1, 5)	6.5	5.5	0.012	137479.152(392)		15.576
6(2, 4) - 6(1, 5)	5.5	5.5	0.210	137479.592(392)		15.576
6(2, 4) - 6(1, 5)	6.5	6.5	0.249	137480.580(394)		15.576
6(2, 4) - 6(1, 5)	5.5	6.5	0.012	137481.021(397)		15.576
10(4, 6) - 11(3, 9)	8.5	9.5	0.214	140347.889(1019)		57.236

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
10(4, 6) - 11(3, 9)	11.5	12.5	0.283	140347.914(1018)		57.236
10(4, 6) - 11(3, 9)	9.5	10.5	0.235	140348.139(1018)		57.236
10(4, 6) - 11(3, 9)	10.5	11.5	0.258	140348.164(1019)		57.236
16(2,14) - 16(1,15)	16.5	16.5	0.254	142276.275(2653)		90.691
16(2,14) - 16(1,15)	15.5	15.5	0.239	142276.598(2652)		90.691
16(2,14) - 16(1,15)	17.5	17.5	0.271	142279.809(2652)		90.691
16(2,14) - 16(1,15)	14.5	14.5	0.226	142280.131(2653)		90.691
15(5,11) - 16(4,12)	13.5	14.5	0.226	142294.021(1542)		113.746
15(5,11) - 16(4,12)	16.5	17.5	0.273	142294.064(1542)		113.746
15(5,11) - 16(4,12)	14.5	15.5	0.240	142294.553(1542)		113.746
15(5,11) - 16(4,12)	15.5	16.5	0.256	142294.596(1542)		113.746
4(2, 2) - 4(1, 3)	3.5	2.5	0.018	143791.072(258)		8.302
4(2, 2) - 4(1, 3)	2.5	2.5	0.149	143791.996(249)		8.302
4(2, 2) - 4(1, 3)	4.5	5.5	0.018	143792.957(253)		8.302
4(2, 2) - 4(1, 3)	5.5	5.5	0.315	143793.881(244)		8.302
4(2, 2) - 4(1, 3)	4.5	3.5	0.024	143797.047(241)		8.302
4(2, 2) - 4(1, 3)	3.5	3.5	0.181	143797.371(243)		8.302
4(2, 2) - 4(1, 3)	2.5	3.5	0.018	143798.297(252)		8.302
4(2, 2) - 4(1, 3)	4.5	4.5	0.236	143799.256(248)		8.302
4(2, 2) - 4(1, 3)	3.5	4.5	0.024	143799.580(251)		8.302
4(2, 2) - 4(1, 3)	5.5	4.5	0.018	143800.182(257)		8.302
2(2, 0) - 2(1, 1)	0.5	0.5	0.050	148607.893(272)		3.666
2(2, 0) - 2(1, 1)	1.5	0.5	0.050	148608.004(250)		3.666
2(2, 0) - 2(1, 1)	3.5	3.5	0.343	148612.506(244)		3.666
2(2, 0) - 2(1, 1)	2.5	3.5	0.057	148612.617(250)		3.666
2(2, 0) - 2(1, 1)	0.5	1.5	0.050	148614.240(260)		3.666
2(2, 0) - 2(1, 1)	1.5	1.5	0.080	148614.352(234)		3.666
2(2, 0) - 2(1, 1)	2.5	1.5	0.070	148614.432(252)		3.666
2(2, 0) - 2(1, 1)	3.5	2.5	0.057	148618.855(244)		3.666
2(2, 0) - 2(1, 1)	1.5	2.5	0.070	148618.887(246)		3.666
2(2, 0) - 2(1, 1)	2.5	2.5	0.173	148618.965(261)		3.666
3(2, 2) - 3(1, 3)	4.5	3.5	0.030	155519.852(243)		5.346
3(2, 2) - 3(1, 3)	3.5	3.5	0.218	155519.852(243)		5.346
3(2, 2) - 3(1, 3)	2.5	3.5	0.038	155519.852(243)		5.346
3(2, 2) - 3(1, 3)	2.5	2.5	0.147	155522.666(230)		5.346
3(2, 2) - 3(1, 3)	1.5	2.5	0.029	155522.666(230)		5.346
3(2, 2) - 3(1, 3)	3.5	2.5	0.038	155522.666(230)		5.346
3(2, 2) - 3(1, 3)	3.5	4.5	0.030	155525.881(234)		5.346
3(2, 2) - 3(1, 3)	4.5	4.5	0.327	155525.881(234)		5.346
3(2, 2) - 3(1, 3)	2.5	1.5	0.029	155528.695(246)		5.346
3(2, 2) - 3(1, 3)	1.5	1.5	0.114	155528.695(246)		5.346
4(3, 1) - 5(2, 4)	3.5	3.5	0.015	156090.822(709)		16.263
4(3, 1) - 5(2, 4)	4.5	4.5	0.020	156090.871(713)		16.263
4(3, 1) - 5(2, 4)	2.5	3.5	0.167	156090.871(719)		16.263
4(3, 1) - 5(2, 4)	5.5	6.5	0.318	156090.871(711)		16.263
4(3, 1) - 5(2, 4)	4.5	5.5	0.258	156090.889(717)		16.263
4(3, 1) - 5(2, 4)	3.5	4.5	0.207	156090.889(709)		16.263
4(3, 1) - 5(2, 4)	5.5	5.5	0.015	156090.938(708)		16.263
9(4, 6) - 10(3, 7)	7.5	8.5	0.211	158844.135(1325)		50.233
9(4, 6) - 10(3, 7)	10.5	11.5	0.286	158844.223(1324)		50.233
9(4, 6) - 10(3, 7)	8.5	9.5	0.233	158844.797(1324)		50.233
9(4, 6) - 10(3, 7)	9.5	10.5	0.258	158844.885(1325)		50.233
18(2,16) - 18(1,17)	18.5	18.5	0.254	160506.141(4228)		113.166
18(2,16) - 18(1,17)	17.5	17.5	0.241	160506.527(4228)		113.166
18(2,16) - 18(1,17)	19.5	19.5	0.269	160510.908(4228)		113.166
18(2,16) - 18(1,17)	16.5	16.5	0.229	160511.297(4229)		113.166

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
10(0,10) - 9(1, 9)	10.5	9.5	0.258	161451.148(543)		29.107
10(0,10) - 9(1, 9)	9.5	8.5	0.233	161451.627(542)		29.107
10(0,10) - 9(1, 9)	11.5	10.5	0.286	161453.734(542)		29.107
10(0,10) - 9(1, 9)	8.5	7.5	0.211	161454.213(543)		29.107
5(2, 4) - 5(1, 5)	5.5	5.5	0.244	162558.396(287)		10.841
5(2, 4) - 5(1, 5)	4.5	5.5	0.016	162558.414(290)		10.841
5(2, 4) - 5(1, 5)	6.5	5.5	0.012	162558.463(300)		10.841
5(2, 4) - 5(1, 5)	5.5	4.5	0.016	162560.139(280)		10.841
5(2, 4) - 5(1, 5)	4.5	4.5	0.199	162560.158(282)		10.841
5(2, 4) - 5(1, 5)	3.5	4.5	0.012	162560.225(296)		10.841
5(2, 4) - 5(1, 5)	5.5	6.5	0.012	162564.578(296)		10.841
5(2, 4) - 5(1, 5)	6.5	6.5	0.306	162564.645(283)		10.841
5(2, 4) - 5(1, 5)	4.5	3.5	0.012	162566.340(301)		10.841
5(2, 4) - 5(1, 5)	3.5	3.5	0.170	162566.406(288)		10.841
14(5, 9) - 15(4,12)	12.5	13.5	0.224	162743.361(2041)		103.478
14(5, 9) - 15(4,12)	15.5	16.5	0.274	162743.391(2040)		103.478
14(5, 9) - 15(4,12)	13.5	14.5	0.240	162743.707(2040)		103.478
14(5, 9) - 15(4,12)	14.5	15.5	0.256	162743.734(2041)		103.478
7(1, 7) - 6(0, 6)	5.5	4.5	0.192	163961.936(552)		13.296
7(1, 7) - 6(0, 6)	8.5	7.5	0.300	163962.881(550)		13.296
7(1, 7) - 6(0, 6)	6.5	6.5	0.010	163966.455(552)		13.296
7(1, 7) - 6(0, 6)	6.5	5.5	0.223	163966.822(550)		13.296
7(1, 7) - 6(0, 6)	7.5	6.5	0.259	163967.766(552)		13.296
14(1,13) - 14(0,14)	14.5	14.5	0.254	164619.502(1130)		65.137
14(1,13) - 14(0,14)	13.5	13.5	0.237	164620.533(1128)		65.137
14(1,13) - 14(0,14)	15.5	15.5	0.274	164629.420(1128)		65.137
14(1,13) - 14(0,14)	12.5	12.5	0.222	164630.451(1130)		65.137
19(6,14) - 20(5,15)	17.5	18.5	0.231	165263.137(2876)		176.080
19(6,14) - 20(5,15)	20.5	21.5	0.268	165263.162(2876)		176.080
19(6,14) - 20(5,15)	18.5	19.5	0.243	165263.516(2876)		176.080
19(6,14) - 20(5,15)	19.5	20.5	0.255	165263.539(2876)		176.080
18(2,16) - 17(3,15)	18.5	17.5	0.256	169159.852(1210)		112.877
18(2,16) - 17(3,15)	17.5	16.5	0.242	169160.242(1209)		112.877
18(2,16) - 17(3,15)	19.5	18.5	0.270	169164.707(1210)		112.877
18(2,16) - 17(3,15)	16.5	15.5	0.229	169165.098(1210)		112.877
7(2, 6) - 7(1, 7)	7.5	7.5	0.251	172828.080(485)		18.766
7(2, 6) - 7(1, 7)	6.5	6.5	0.218	172829.375(482)		18.766
7(2, 6) - 7(1, 7)	8.5	8.5	0.293	172834.445(482)		18.766
7(2, 6) - 7(1, 7)	5.5	5.5	0.193	172835.742(486)		18.766
3(3, 1) - 4(2, 2)	1.5	2.5	0.143	174504.641(840)		13.098
3(3, 1) - 4(2, 2)	2.5	2.5	0.023	174504.957(808)		13.098
3(3, 1) - 4(2, 2)	4.5	5.5	0.333	174505.113(821)		13.098
3(3, 1) - 4(2, 2)	2.5	3.5	0.191	174505.883(816)		13.098
3(3, 1) - 4(2, 2)	3.5	3.5	0.030	174506.029(831)		13.098
3(3, 1) - 4(2, 2)	4.5	4.5	0.023	174506.037(811)		13.098
3(3, 1) - 4(2, 2)	3.5	4.5	0.255	174506.355(835)		13.098
8(4, 4) - 9(3, 7)	6.5	7.5	0.206	179047.445(1625)		43.814
8(4, 4) - 9(3, 7)	9.5	10.5	0.289	179047.486(1624)		43.814
8(4, 4) - 9(3, 7)	7.5	8.5	0.231	179047.756(1624)		43.814
8(4, 4) - 9(3, 7)	8.5	9.5	0.259	179047.799(1625)		43.814
13(5, 9) - 14(4,10)	11.5	12.5	0.222	182112.359(2623)		93.888
13(5, 9) - 14(4,10)	14.5	15.5	0.276	182112.398(2623)		93.888
13(5, 9) - 14(4,10)	12.5	13.5	0.239	182112.771(2623)		93.888
13(5, 9) - 14(4,10)	13.5	14.5	0.257	182112.811(2623)		93.888
18(6,12) - 19(5,15)	16.5	17.5	0.230	185280.631(3763)		163.268
18(6,12) - 19(5,15)	19.5	20.5	0.269	185280.652(3763)		163.268

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
18(6,12) - 19(5,15)	17.5	18.5	0.242	185280.951(3763)		163.268
18(6,12) - 19(5,15)	18.5	19.5	0.255	185280.973(3763)		163.268
14(1,13) - 13(2,12)	14.5	13.5	0.257	185632.943(921)		64.436
14(1,13) - 13(2,12)	13.5	12.5	0.239	185633.408(920)		64.436
14(1,13) - 13(2,12)	15.5	14.5	0.276	185637.350(920)		64.436
14(1,13) - 13(2,12)	12.5	11.5	0.222	185637.814(921)		64.436
20(2,18) - 20(1,19)	20.5	20.5	0.254	186176.428(6677)		138.001
20(2,18) - 20(1,19)	19.5	19.5	0.242	186176.850(6676)		138.001
20(2,18) - 20(1,19)	21.5	21.5	0.267	186182.189(6676)		138.001
20(2,18) - 20(1,19)	18.5	18.5	0.231	186182.611(6677)		138.001
9(2, 8) - 9(1, 9)	9.5	9.5	0.254	186391.270(790)		29.107
9(2, 8) - 9(1, 9)	8.5	8.5	0.227	186392.299(787)		29.107
9(2, 8) - 9(1, 9)	10.5	10.5	0.285	186397.717(787)		29.107
9(2, 8) - 9(1, 9)	7.5	7.5	0.206	186398.746(790)		29.107
2(2, 0) - 1(1, 1)	0.5	1.5	0.017	189882.316(328)		2.289
2(2, 0) - 1(1, 1)	1.5	1.5	0.107	189882.428(306)		2.289
2(2, 0) - 1(1, 1)	2.5	1.5	0.210	189882.506(308)		2.289
2(2, 0) - 1(1, 1)	3.5	2.5	0.400	189888.744(299)		2.289
2(2, 0) - 1(1, 1)	2.5	2.5	0.090	189888.854(313)		2.289
2(2, 0) - 1(1, 1)	0.5	0.5	0.083	189893.742(315)		2.289
2(2, 0) - 1(1, 1)	1.5	0.5	0.083	189893.854(309)		2.289
9(1, 9) - 8(0, 8)	7.5	6.5	0.206	192270.002(838)		22.694
9(1, 9) - 8(0, 8)	10.5	9.5	0.289	192270.578(836)		22.694
9(1, 9) - 8(0, 8)	8.5	7.5	0.231	192273.945(836)		22.694
9(1, 9) - 8(0, 8)	9.5	8.5	0.259	192274.521(838)		22.694
7(4, 4) - 8(3, 5)	5.5	6.5	0.200	198123.777(1938)		38.073
7(4, 4) - 8(3, 5)	8.5	9.5	0.294	198123.859(1936)		38.073
7(4, 4) - 8(3, 5)	6.5	7.5	0.227	198124.273(1936)		38.073
7(4, 4) - 8(3, 5)	7.5	8.5	0.259	198124.355(1938)		38.073
18(3,15) - 18(2,16)	16.5	16.5	0.229	199330.674(7564)		118.520
18(3,15) - 18(2,16)	19.5	19.5	0.269	199330.828(7563)		118.520
18(3,15) - 18(2,16)	17.5	17.5	0.241	199332.580(7563)		118.520
18(3,15) - 18(2,16)	18.5	18.5	0.254	199332.736(7564)		118.520
12(5, 7) - 13(4,10)	10.5	11.5	0.220	201924.893(3231)		84.925
12(5, 7) - 13(4,10)	13.5	14.5	0.278	201924.924(3230)		84.925
12(5, 7) - 13(4,10)	11.5	12.5	0.238	201925.211(3230)		84.925
12(5, 7) - 13(4,10)	12.5	13.5	0.257	201925.242(3231)		84.925
16(1,15) - 16(0,16)	16.5	16.5	0.254	202180.992(1934)		83.947
16(1,15) - 16(0,16)	15.5	15.5	0.239	202181.869(1932)		83.947
16(1,15) - 16(0,16)	17.5	17.5	0.271	202190.613(1932)		83.947
16(1,15) - 16(0,16)	14.5	14.5	0.226	202191.490(1934)		83.947
11(2,10) - 11(1,11)	11.5	11.5	0.254	203262.340(1218)		41.852
11(2,10) - 11(1,11)	10.5	10.5	0.233	203263.193(1216)		41.852
11(2,10) - 11(1,11)	12.5	12.5	0.280	203268.834(1216)		41.852
11(2,10) - 11(1,11)	9.5	9.5	0.215	203269.688(1218)		41.852
12(0,12) - 11(1,11)	12.5	11.5	0.257	203788.385(969)		41.852
12(0,12) - 11(1,11)	11.5	10.5	0.237	203788.662(968)		41.852
12(0,12) - 11(1,11)	13.5	12.5	0.280	203790.055(968)		41.852
12(0,12) - 11(1,11)	10.5	9.5	0.217	203790.332(969)		41.852
17(6,12) - 18(5,13)	15.5	16.5	0.229	204928.396(4775)		151.110
17(6,12) - 18(5,13)	18.5	19.5	0.270	204928.420(4775)		151.110
17(6,12) - 18(5,13)	16.5	17.5	0.242	204928.717(4775)		151.110
17(6,12) - 18(5,13)	17.5	18.5	0.256	204928.738(4775)		151.110
3(2, 2) - 2(1, 1)	1.5	0.5	0.100	205870.078(334)		3.666
3(2, 2) - 2(1, 1)	4.5	3.5	0.357	205874.613(322)		3.666
3(2, 2) - 2(1, 1)	3.5	3.5	0.041	205874.613(322)		3.666

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
3(2, 2) - 2(1, 1)	2.5	1.5	0.160	205876.426(318)		3.666
3(2, 2) - 2(1, 1)	1.5	1.5	0.040	205876.426(318)		3.666
3(2, 2) - 2(1, 1)	3.5	2.5	0.245	205880.961(330)		3.666
3(2, 2) - 2(1, 1)	2.5	2.5	0.052	205880.961(330)		3.666
16(3,13) - 16(2,14)	14.5	14.5	0.226	209423.986(4823)		95.437
16(3,13) - 16(2,14)	17.5	17.5	0.271	209424.240(4822)		95.437
16(3,13) - 16(2,14)	15.5	15.5	0.239	209426.756(4822)		95.437
16(3,13) - 16(2,14)	16.5	16.5	0.254	209427.010(4823)		95.437
6(4, 2) - 7(3, 5)	4.5	5.5	0.192	217626.854(2233)		32.956
6(4, 2) - 7(3, 5)	7.5	8.5	0.300	217626.928(2230)		32.956
6(4, 2) - 7(3, 5)	6.5	6.5	0.010	217627.207(2230)		32.956
6(4, 2) - 7(3, 5)	5.5	6.5	0.223	217627.238(2229)		32.956
6(4, 2) - 7(3, 5)	6.5	7.5	0.259	217627.311(2233)		32.956
11(1,11) - 10(0,10)	9.5	8.5	0.214	220616.645(1212)		34.493
11(1,11) - 10(0,10)	12.5	11.5	0.283	220616.979(1212)		34.493
11(1,11) - 10(0,10)	10.5	9.5	0.235	220619.586(1211)		34.493
11(1,11) - 10(0,10)	11.5	10.5	0.258	220619.920(1212)		34.493
14(3,11) - 14(2,12)	12.5	12.5	0.222	220982.020(3007)		75.005
14(3,11) - 14(2,12)	15.5	15.5	0.274	220982.355(3006)		75.005
14(3,11) - 14(2,12)	13.5	13.5	0.237	220985.266(3006)		75.005
14(3,11) - 14(2,12)	14.5	14.5	0.254	220985.602(3006)		75.005
11(5, 7) - 12(4, 8)	9.5	10.5	0.217	221325.514(3881)		76.616
11(5, 7) - 12(4, 8)	12.5	13.5	0.280	221325.551(3881)		76.616
11(5, 7) - 12(4, 8)	10.5	11.5	0.237	221325.854(3880)		76.616
11(5, 7) - 12(4, 8)	11.5	12.5	0.257	221325.891(3881)		76.616
13(2,12) - 13(1,13)	13.5	13.5	0.254	223373.205(1878)		56.985
13(2,12) - 13(1,13)	12.5	12.5	0.236	223373.932(1876)		56.985
13(2,12) - 13(1,13)	14.5	14.5	0.276	223379.695(1876)		56.985
13(2,12) - 13(1,13)	11.5	11.5	0.220	223380.420(1878)		56.985
16(6,10) - 17(5,13)	14.5	15.5	0.227	224636.512(5871)		139.592
16(6,10) - 17(5,13)	17.5	18.5	0.271	224636.533(5870)		139.592
16(6,10) - 17(5,13)	15.5	16.5	0.241	224636.797(5870)		139.592
16(6,10) - 17(5,13)	16.5	17.5	0.256	224636.818(5871)		139.592
20(2,18) - 19(3,17)	20.5	19.5	0.255	230432.615(3010)		136.525
20(2,18) - 19(3,17)	19.5	18.5	0.243	230432.955(3009)		136.525
20(2,18) - 19(3,17)	21.5	20.5	0.268	230437.285(3009)		136.525
20(2,18) - 19(3,17)	18.5	17.5	0.231	230437.625(3010)		136.525
12(3, 9) - 12(2,10)	10.5	10.5	0.218	231894.729(1903)		57.256
12(3, 9) - 12(2,10)	13.5	13.5	0.278	231895.123(1902)		57.256
12(3, 9) - 12(2,10)	11.5	11.5	0.234	231897.992(1902)		57.256
12(3, 9) - 12(2,10)	12.5	12.5	0.254	231898.387(1903)		57.256
4(2, 2) - 3(1, 3)	4.5	3.5	0.255	232415.137(389)		5.346
4(2, 2) - 3(1, 3)	3.5	3.5	0.030	232415.461(392)		5.346
4(2, 2) - 3(1, 3)	3.5	2.5	0.191	232418.275(379)		5.346
4(2, 2) - 3(1, 3)	2.5	2.5	0.023	232419.201(387)		5.346
4(2, 2) - 3(1, 3)	4.5	4.5	0.023	232421.168(390)		5.346
4(2, 2) - 3(1, 3)	5.5	4.5	0.333	232422.092(382)		5.346
4(2, 2) - 3(1, 3)	2.5	1.5	0.143	232425.230(392)		5.346
5(4, 2) - 6(3, 3)	3.5	4.5	0.182	236813.650(2510)		28.489
5(4, 2) - 6(3, 3)	4.5	4.5	0.010	236813.717(2494)		28.489
5(4, 2) - 6(3, 3)	6.5	7.5	0.308	236813.773(2503)		28.489
5(4, 2) - 6(3, 3)	4.5	5.5	0.217	236814.162(2502)		28.489
5(4, 2) - 6(3, 3)	5.5	5.5	0.014	236814.180(2507)		28.489
5(4, 2) - 6(3, 3)	6.5	6.5	0.010	236814.219(2494)		28.489
5(4, 2) - 6(3, 3)	5.5	6.5	0.259	236814.285(2509)		28.489
5(2, 4) - 4(1, 3)	3.5	2.5	0.167	238678.889(521)		8.302

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
5(2, 4) - 4(1, 3)	5.5	5.5	0.015	238681.012(528)		8.302
5(2, 4) - 4(1, 3)	6.5	5.5	0.318	238681.078(516)		8.302
5(2, 4) - 4(1, 3)	4.5	3.5	0.207	238685.121(514)		8.302
5(2, 4) - 4(1, 3)	3.5	3.5	0.015	238685.188(527)		8.302
5(2, 4) - 4(1, 3)	5.5	4.5	0.258	238687.313(520)		8.302
5(2, 4) - 4(1, 3)	4.5	4.5	0.020	238687.330(521)		8.302
16(1,15) - 15(2,14)	16.5	15.5	0.256	238963.697(1893)		82.720
16(1,15) - 15(2,14)	15.5	14.5	0.240	238964.043(1892)		82.720
16(1,15) - 15(2,14)	17.5	16.5	0.273	238967.402(1892)		82.720
16(1,15) - 15(2,14)	14.5	13.5	0.226	238967.750(1893)		82.720
10(3, 7) - 10(2, 8)	8.5	8.5	0.211	240609.766(1202)		42.207
10(3, 7) - 10(2, 8)	11.5	11.5	0.282	240610.176(1201)		42.207
10(3, 7) - 10(2, 8)	9.5	9.5	0.230	240612.617(1201)		42.207
10(3, 7) - 10(2, 8)	10.5	10.5	0.254	240613.027(1202)		42.207
10(5, 5) - 11(4, 8)	8.5	9.5	0.214	240810.682(4539)		68.944
10(5, 5) - 11(4, 8)	11.5	12.5	0.283	240810.717(4538)		68.944
10(5, 5) - 11(4, 8)	9.5	10.5	0.235	240810.982(4538)		68.944
10(5, 5) - 11(4, 8)	10.5	11.5	0.258	240811.018(4539)		68.944
18(1,17) - 18(0,18)	18.5	18.5	0.254	242480.109(3414)		105.078
18(1,17) - 18(0,18)	17.5	17.5	0.241	242480.842(3412)		105.078
18(1,17) - 18(0,18)	19.5	19.5	0.269	242489.102(3412)		105.078
18(1,17) - 18(0,18)	16.5	16.5	0.229	242489.832(3414)		105.078
15(6,10) - 16(5,11)	13.5	14.5	0.226	244170.805(7051)		128.722
15(6,10) - 16(5,11)	16.5	17.5	0.273	244170.826(7051)		128.722
15(6,10) - 16(5,11)	14.5	15.5	0.240	244171.082(7051)		128.722
15(6,10) - 16(5,11)	15.5	16.5	0.256	244171.104(7051)		128.722
14(0,14) - 13(1,13)	14.5	13.5	0.257	244386.646(1668)		56.985
14(0,14) - 13(1,13)	13.5	12.5	0.239	244386.807(1667)		56.985
14(0,14) - 13(1,13)	15.5	14.5	0.276	244387.625(1667)		56.985
14(0,14) - 13(1,13)	12.5	11.5	0.222	244387.785(1668)		56.985
8(3, 5) - 8(2, 6)	6.5	6.5	0.201	246453.959(678)		29.852
8(3, 5) - 8(2, 6)	9.5	9.5	0.289	246454.346(677)		29.852
8(3, 5) - 8(2, 6)	7.5	7.5	0.223	246456.121(677)		29.852
8(3, 5) - 8(2, 6)	8.5	8.5	0.253	246456.508(678)		29.852
15(2,14) - 15(1,15)	15.5	15.5	0.254	246551.861(2967)		74.495
15(2,14) - 15(1,15)	14.5	14.5	0.238	246552.486(2965)		74.495
15(2,14) - 15(1,15)	16.5	16.5	0.273	246558.289(2965)		74.495
15(2,14) - 15(1,15)	13.5	13.5	0.224	246558.914(2967)		74.495
6(3, 3) - 6(2, 4)	4.5	4.5	0.184	249648.900(384)		20.162
6(3, 3) - 6(2, 4)	7.5	7.5	0.299	249649.236(382)		20.162
6(3, 3) - 6(2, 4)	6.5	5.5	0.012	249650.215(380)		20.162
6(3, 3) - 6(2, 4)	5.5	5.5	0.210	249650.320(382)		20.162
6(3, 3) - 6(2, 4)	6.5	6.5	0.249	249650.656(384)		20.162
6(3, 3) - 6(2, 4)	5.5	6.5	0.012	249650.762(386)		20.162
13(1,13) - 12(0,12)	11.5	10.5	0.220	249905.137(1786)		48.649
13(1,13) - 12(0,12)	14.5	13.5	0.278	249905.314(1786)		48.649
13(1,13) - 12(0,12)	12.5	11.5	0.238	249907.176(1786)		48.649
13(1,13) - 12(0,12)	13.5	12.5	0.257	249907.355(1786)		48.649
4(3, 1) - 4(2, 2)	3.5	2.5	0.018	250977.713(556)		13.098
4(3, 1) - 4(2, 2)	2.5	2.5	0.149	250977.762(565)		13.098
4(3, 1) - 4(2, 2)	4.5	5.5	0.018	250978.020(554)		13.098
4(3, 1) - 4(2, 2)	5.5	5.5	0.315	250978.068(559)		13.098
4(3, 1) - 4(2, 2)	4.5	3.5	0.024	250978.621(560)		13.098
4(3, 1) - 4(2, 2)	3.5	3.5	0.181	250978.639(557)		13.098
4(3, 1) - 4(2, 2)	2.5	3.5	0.018	250978.688(555)		13.098
4(3, 1) - 4(2, 2)	4.5	4.5	0.236	250978.945(564)		13.098

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
4(3, 1) - 4(2, 2)	3.5	4.5	0.024	250978.963(561)		13.098
4(3, 1) - 4(2, 2)	5.5	4.5	0.018	250978.994(555)		13.098
3(3, 1) - 3(2, 2)	1.5	1.5	0.114	251401.176(718)		10.533
3(3, 1) - 3(2, 2)	1.5	2.5	0.029	251401.176(718)		10.533
3(3, 1) - 3(2, 2)	4.5	4.5	0.327	251401.322(702)		10.533
3(3, 1) - 3(2, 2)	4.5	3.5	0.030	251401.322(702)		10.533
3(3, 1) - 3(2, 2)	2.5	1.5	0.029	251401.492(698)		10.533
3(3, 1) - 3(2, 2)	2.5	3.5	0.038	251401.492(698)		10.533
3(3, 1) - 3(2, 2)	2.5	2.5	0.147	251401.492(698)		10.533
3(3, 1) - 3(2, 2)	3.5	3.5	0.218	251401.641(713)		10.533
3(3, 1) - 3(2, 2)	3.5	2.5	0.038	251401.641(713)		10.533
3(3, 1) - 3(2, 2)	3.5	4.5	0.030	251401.641(713)		10.533
5(3, 3) - 5(2, 4)	5.5	6.5	0.012	251702.234(431)		16.263
5(3, 3) - 5(2, 4)	5.5	4.5	0.016	251702.283(427)		16.263
5(3, 3) - 5(2, 4)	4.5	3.5	0.012	251702.285(435)		16.263
5(3, 3) - 5(2, 4)	5.5	5.5	0.244	251702.301(432)		16.263
5(3, 3) - 5(2, 4)	4.5	4.5	0.199	251702.352(428)		16.263
5(3, 3) - 5(2, 4)	4.5	5.5	0.016	251702.371(432)		16.263
5(3, 3) - 5(2, 4)	6.5	6.5	0.306	251702.482(429)		16.263
5(3, 3) - 5(2, 4)	3.5	3.5	0.170	251702.535(432)		16.263
5(3, 3) - 5(2, 4)	6.5	5.5	0.012	251702.549(434)		16.263
5(3, 3) - 5(2, 4)	3.5	4.5	0.012	251702.602(430)		16.263
7(3, 5) - 7(2, 6)	7.5	7.5	0.251	252590.904(469)		24.531
7(3, 5) - 7(2, 6)	6.5	6.5	0.218	252591.023(467)		24.531
7(3, 5) - 7(2, 6)	8.5	8.5	0.293	252591.492(468)		24.531
7(3, 5) - 7(2, 6)	5.5	5.5	0.193	252591.611(469)		24.531
9(3, 7) - 9(2, 8)	9.5	9.5	0.254	254508.711(905)		35.325
9(3, 7) - 9(2, 8)	8.5	8.5	0.227	254508.873(904)		35.325
9(3, 7) - 9(2, 8)	10.5	10.5	0.285	254509.727(904)		35.325
9(3, 7) - 9(2, 8)	7.5	7.5	0.206	254509.889(905)		35.325
4(4, 0) - 5(3, 3)	2.5	3.5	0.167	256047.523(2756)		24.659
4(4, 0) - 5(3, 3)	5.5	6.5	0.318	256047.727(2743)		24.659
4(4, 0) - 5(3, 3)	3.5	3.5	0.015	256047.900(2737)		24.659
4(4, 0) - 5(3, 3)	5.5	5.5	0.015	256047.975(2740)		24.659
4(4, 0) - 5(3, 3)	3.5	4.5	0.207	256048.148(2740)		24.659
4(4, 0) - 5(3, 3)	4.5	4.5	0.020	256048.281(2753)		24.659
4(4, 0) - 5(3, 3)	4.5	5.5	0.258	256048.352(2753)		24.659
11(3, 9) - 11(2,10)	11.5	11.5	0.254	257954.994(1521)		48.632
11(3, 9) - 11(2,10)	10.5	10.5	0.233	257955.188(1521)		48.632
11(3, 9) - 11(2,10)	12.5	12.5	0.280	257956.467(1521)		48.632
11(3, 9) - 11(2,10)	9.5	9.5	0.215	257956.660(1521)		48.632
9(5, 5) - 10(4, 6)	7.5	8.5	0.211	260138.160(5198)		61.918
9(5, 5) - 10(4, 6)	10.5	11.5	0.286	260138.201(5197)		61.918
9(5, 5) - 10(4, 6)	8.5	9.5	0.233	260138.473(5197)		61.918
9(5, 5) - 10(4, 6)	9.5	10.5	0.258	260138.514(5198)		61.918
13(3,11) - 13(2,12)	13.5	13.5	0.254	263435.871(2470)		64.436
13(3,11) - 13(2,12)	12.5	12.5	0.236	263436.090(2469)		64.436
13(3,11) - 13(2,12)	14.5	14.5	0.276	263437.813(2469)		64.436
13(3,11) - 13(2,12)	11.5	11.5	0.220	263438.027(2470)		64.436
14(6, 8) - 15(5,11)	12.5	13.5	0.224	263678.781(8285)		118.492
14(6, 8) - 15(5,11)	15.5	16.5	0.274	263678.801(8285)		118.492
14(6, 8) - 15(5,11)	13.5	14.5	0.240	263679.039(8285)		118.492
14(6, 8) - 15(5,11)	14.5	15.5	0.256	263679.059(8285)		118.492
7(2, 6) - 6(1, 5)	5.5	4.5	0.192	268446.430(892)		15.576
7(2, 6) - 6(1, 5)	8.5	7.5	0.300	268447.871(889)		15.576
7(2, 6) - 6(1, 5)	6.5	5.5	0.223	268452.547(888)		15.576

TABLE 5. Measured and calculated microwave spectrum of $^{33}SO_2$ in the vibrational ground state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	F'	F''	Rel. I	Calculated Frequency	Measured Frequency	Energy lower st.
7(2, 6) - 6(1, 5)	6.5	6.5	0.010	268453.977(893)		15.576
7(2, 6) - 6(1, 5)	7.5	6.5	0.259	268453.992(892)		15.576
15(3,13) - 15(2,14)	15.5	15.5	0.254	271414.684(4108)		82.720
15(3,13) - 15(2,14)	14.5	14.5	0.238	271414.918(4107)		82.720
15(3,13) - 15(2,14)	16.5	16.5	0.273	271417.082(4107)		82.720
15(3,13) - 15(2,14)	13.5	13.5	0.224	271417.316(4108)		82.720
17(2,16) - 17(1,17)	17.5	17.5	0.254	272520.980(4754)		94.371
17(2,16) - 17(1,17)	16.5	16.5	0.240	272521.523(4752)		94.371
17(2,16) - 17(1,17)	18.5	18.5	0.270	272527.289(4752)		94.371
17(2,16) - 17(1,17)	15.5	15.5	0.227	272527.832(4754)		94.371
6(2, 4) - 5(1, 5)	6.5	5.5	0.259	279429.398(645)		10.841
6(2, 4) - 5(1, 5)	5.5	5.5	0.014	279429.840(647)		10.841
6(2, 4) - 5(1, 5)	5.5	4.5	0.217	279431.586(639)		10.841
6(2, 4) - 5(1, 5)	4.5	4.5	0.010	279433.449(653)		10.841
6(2, 4) - 5(1, 5)	6.5	6.5	0.010	279435.582(654)		10.841
6(2, 4) - 5(1, 5)	7.5	6.5	0.308	279437.445(640)		10.841
6(2, 4) - 5(1, 5)	4.5	3.5	0.182	279439.633(646)		10.841
8(5, 3) - 9(4, 6)	6.5	7.5	0.206	279446.609(5837)		55.532
8(5, 3) - 9(4, 6)	9.5	10.5	0.289	279446.656(5835)		55.532
8(5, 3) - 9(4, 6)	7.5	8.5	0.231	279446.926(5835)		55.532
8(5, 3) - 9(4, 6)	8.5	9.5	0.259	279446.973(5837)		55.532
15(1,15) - 14(0,14)	13.5	12.5	0.224	280553.285(2792)		65.137
15(1,15) - 14(0,14)	16.5	15.5	0.274	280553.371(2792)		65.137
15(1,15) - 14(0,14)	14.5	13.5	0.240	280554.625(2792)		65.137
15(1,15) - 14(0,14)	15.5	14.5	0.256	280554.711(2792)		65.137
17(3,15) - 17(2,16)	17.5	17.5	0.254	282269.488(6853)		103.462
17(3,15) - 17(2,16)	16.5	16.5	0.240	282269.734(6853)		103.462
17(3,15) - 17(2,16)	18.5	18.5	0.270	282272.316(6853)		103.462
17(3,15) - 17(2,16)	15.5	15.5	0.227	282272.559(6853)		103.462
13(6, 8) - 14(5, 9)	11.5	12.5	0.222	283093.988(9561)		108.907
13(6, 8) - 14(5, 9)	14.5	15.5	0.276	283094.012(9560)		108.907
13(6, 8) - 14(5, 9)	12.5	13.5	0.239	283094.242(9560)		108.907
13(6, 8) - 14(5, 9)	13.5	14.5	0.257	283094.266(9561)		108.907
16(0,16) - 15(1,15)	16.5	15.5	0.256	283334.566(2924)		74.495
16(0,16) - 15(1,15)	15.5	14.5	0.240	283334.660(2924)		74.495
16(0,16) - 15(1,15)	17.5	16.5	0.273	283335.078(2924)		74.495
16(0,16) - 15(1,15)	14.5	13.5	0.226	283335.172(2924)		74.495
20(1,19) - 20(0,20)	20.5	20.5	0.254	283786.414(6115)		128.535
20(1,19) - 20(0,20)	19.5	19.5	0.242	283787.016(6113)		128.535
20(1,19) - 20(0,20)	21.5	21.5	0.267	283794.590(6113)		128.535
20(1,19) - 20(0,20)	18.5	18.5	0.231	283795.191(6115)		128.535
18(1,17) - 17(2,16)	18.5	17.5	0.256	290923.199(3829)		103.462
18(1,17) - 17(2,16)	17.5	16.5	0.242	290923.445(3828)		103.462
18(1,17) - 17(2,16)	19.5	18.5	0.270	290926.117(3829)		103.462
18(1,17) - 17(2,16)	16.5	15.5	0.229	290926.363(3829)		103.462
9(2, 8) - 8(1, 7)	7.5	6.5	0.206	295318.020(1389)		25.474
9(2, 8) - 8(1, 7)	10.5	9.5	0.289	295319.078(1387)		25.474
9(2, 8) - 8(1, 7)	8.5	7.5	0.231	295323.977(1387)		25.474
9(2, 8) - 8(1, 7)	9.5	8.5	0.259	295325.039(1389)		25.474
7(5, 3) - 8(4, 4)	5.5	6.5	0.200	298687.043(6441)		49.787
7(5, 3) - 8(4, 4)	8.5	9.5	0.294	298687.105(6438)		49.787
7(5, 3) - 8(4, 4)	6.5	7.5	0.227	298687.395(6437)		49.787
7(5, 3) - 8(4, 4)	7.5	8.5	0.259	298687.457(6441)		49.787

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $v_2=1$ vibrationally excited state (MHz)

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency		-log(A)	S_{ij}	Energy lower st.	Reference
18(3,15) - 17(4,14)		851.387(	56)	11.8590	2.788	125.745	
15(2,14) - 14(3,11)		1069.344(	39)	11.6070	2.034	83.005	
26(3,23) - 27(2,26)		4275.668(	89)	10.3814	0.934	243.874	
18(4,14) - 19(3,17)		4332.948(	43)	9.7128	2.855	137.190	
40(7,33) - 39(8,32)		5086.181(	68)	9.5127	6.213	610.339	
28(6,22) - 29(5,25)		6326.633(	45)	9.2115	4.470	322.249	
49(10,40) - 50(9,41)	8793.800(200)	8793.825(	106)	8.7809	7.749	956.860	[68A]
33(7,27) - 34(6,28)	8797.400(100)	8797.399(	48)	8.7824	5.250	443.895	[68A]
35(6,30) - 34(7,27)	9509.700(100)	9509.716(	58)	8.6951	5.438	465.998	[68A]
11(3, 9) - 12(2,10)	10527.600(100)	10527.604(	46)	8.5331	1.873	57.523	[68A]
24(4,20) - 23(5,19)	11456.950(100)	11457.091(	55)	8.4547	3.727	220.145	[68A]
51(9,43) - 50(10,40)	11994.300(200)	11994.337(	124)	8.3912	7.945	989.187	[68A]
38(4,34) - 39(3,37)	12756.200(100)	12756.266(	155)	9.0431	1.099	509.641	[68A]
12(2,10) - 13(1,13)	13084.100(100)	13083.930(	55)	8.6608	0.793	57.087	[68A]
1(1, 1) - 2(0, 2)	13457.500(100)	13457.342(	9)	7.8842	0.522	1.911	[68A]
54(11,43) - 55(10,46)	15309.200(200)	15309.199(	135)	8.0605	8.517	1159.049	[68A]
25(4,22) - 24(5,19)	16048.540(100)	16048.555(	49)	8.0177	3.854	235.574	[64B]
49(4,46) - 48(5,43)	16069.000(200)	16069.083(	304)	8.7296	1.453	807.816	[68A]
10(2, 8) - 11(1,11)	16126.890(100)	16126.931(	41)	8.2485	0.919	41.943	[64B]
38(8,30) - 39(7,33)	17341.900(300)	17341.733(	73)	7.9004	6.015	584.758	[62B]
46(8,38) - 45(9,37)	19229.600(300)	19229.481(	94)	7.7742	7.176	802.913	[62B]
14(2,12) - 15(1,15)	19681.130(100)	19681.110(	71)	8.2919	0.632	74.610	[64B]
25(2,24) - 24(3,21)	21264.290(100)	21264.356(	80)	8.1618	1.184	210.371	[64B]
59(12,48) - 60(11,49)	21479.500(200)	21479.340(	230)	7.6201	9.285	1380.537	[68A]
8(1, 7) - 7(2, 6)	22065.730(100)	22065.683(	34)	7.5057	1.605	24.816	[64A]
27(6,22) - 28(5,23)	22220.360(100)	22220.330(	42)	7.5790	4.287	303.756	[64B]
17(2,16) - 16(3,13)	22733.990(100)	22733.891(	49)	7.6659	2.088	103.042	[64B]
22(5,17) - 23(4,20)	22904.860(100)	22904.897(	43)	7.5411	3.497	204.648	[64B]
30(5,25) - 29(6,24)	22928.520(100)	22928.584(	59)	7.5466	4.679	341.054	[64B]
43(9,35) - 44(8,36)	23206.350(300)	23206.323(	85)	7.5217	6.784	745.096	[62B]
41(7,35) - 40(8,32)	24796.900(300)	24796.977(	83)	7.4423	6.402	635.993	[62B]
12(3, 9) - 13(2,12)	26411.750(100)	26411.527(	34)	7.3809	1.834	64.744	[64A]
57(10,48) - 56(11,45)	26489.400(200)	26489.271(	206)	7.3557	8.908	1230.641	[68A]
5(2, 4) - 6(1, 5)	26850.300(200)	26850.272(	26)	7.2882	0.951	15.650	[62A]
4(0, 4) - 3(1, 3)	28138.300(200)	28138.377(	19)	6.8967	1.665	5.417	[62A]
8(2, 6) - 9(1, 9)	28173.400(200)	28173.509(	30)	7.4191	0.941	29.190	[62D]
21(3,19) - 20(4,16)	29052.630(100)	29052.628(	51)	7.2619	3.118	162.411	[64B]
48(10,38) - 49(9,41)	29861.200(200)	29861.126(	109)	7.1939	7.551	924.768	[68A]
37(3,35) - 36(4,32)	30948.200(100)	30948.359(	144)	7.7831	1.351	460.544	[68A]
32(7,25) - 33(6,28)	32214.620(100)	32214.593(	52)	7.0968	5.049	421.959	[64B]
52(9,43) - 51(10,42)	33483.300(200)	33483.328(	143)	7.0493	8.138	1021.867	[68A]
31(5,27) - 30(6,24)	34530.220(100)	34530.273(	60)	7.0125	4.836	360.325	[64B]
21(5,17) - 22(4,18)	34971.600(100)	34971.591(	47)	6.9921	3.324	190.131	[64B]
36(6,30) - 35(7,29)	35448.000(100)	35447.865(	82)	6.9760	5.636	488.447	[64B]
16(2,14) - 17(1,17)	35855.860(100)	35855.814(	91)	7.6827	0.484	94.502	[64C]
53(11,43) - 54(10,44)	36003.600(200)	36003.591(	138)	6.9507	8.318	1123.785	[68A]
23(2,22) - 22(3,19)	36791.070(100)	36791.011(	79)	7.3178	1.473	179.434	[64B]
19(2,18) - 18(3,15)	36857.000(100)	36856.946(	61)	7.1048	1.987	125.774	[64D]
37(8,30) - 38(7,31)	37525.200(100)	37525.181(	62)	6.8985	5.818	559.728	[64B]
28(3,25) - 29(2,28)	38843.500(100)	38843.637(	137)	7.6326	0.738	279.032	[68A]
47(8,40) - 46(9,37)	39698.700(200)	39698.621(	115)	6.8268	7.365	832.407	[68A]
16(4,12) - 17(3,15)	40313.080(100)	40313.112(	41)	6.8135	2.514	113.532	[64B]
21(2,20) - 20(3,17)	41887.490(100)	41887.405(	73)	7.0327	1.762	151.232	[64B]
14(2,12) - 13(3,11)	42005.350(100)	42005.417(	57)	6.7258	2.391	73.866	[64B]
58(12,46) - 59(11,49)	42111.900(200)	42111.905(	268)	6.7468	9.085	1342.095	[68A]
50(5,45) - 51(4,48)	42615.900(200)	42615.960(	371)	7.5353	1.232	871.653	[68A]

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $\nu_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
42(9,33) - 43(8,36)	44438.050(100)	44438.079(88)	6.6788	6.583	716.836	[68A]
15(4,12) - 16(3,13)	47017.600(60)	47017.612(49)	6.6131	2.361	103.042	[64C]
26(6,20) - 27(5,23)	47269.310(60)	47269.293(44)	6.6015	4.079	285.618	[64C]
58(10,48) - 57(11,47)	47745.800(200)	47745.924(291)	6.5854	9.101	1267.147	[68A]
6(2, 4) - 7(1, 7)	47950.790(60)	47950.810(27)	6.6745	0.811	18.843	[64A]
42(7,35) - 41(8,34)	48732.700(200)	48732.485(122)	6.5591	6.595	662.290	[68A]
47(10,38) - 48(9,39)	50523.700(200)	50523.742(114)	6.5120	7.350	893.336	[68A]
37(6,32) - 36(7,29)	51485.100(100)	51485.105(87)	6.4882	5.807	511.560	[68A]
31(7,25) - 32(6,26)	51645.000(100)	51645.205(47)	6.4859	4.850	400.799	[68A]
20(3,17) - 19(4,16)		53049.150(68)	6.4428	3.221	149.463	
27(4,24) - 26(5,21)		53634.113(70)	6.4450	4.159	268.349	
2(1, 1) - 2(0, 2)	54738.800(100)	54738.866(24)	5.6044	2.463	1.911	[68A]
52(11,41) - 53(10,44)	56699.500(200)	56699.659(187)	6.3620	8.116	1089.164	[68A]
10(3, 7) - 11(2,10)	58101.040(100)	58101.195(35)	6.3598	1.519	48.929	[65A]
23(3,21) - 22(4,18)	58524.320(100)	58524.350(70)	6.3672	3.271	190.131	[65A]
36(8,28) - 37(7,31)	59013.400(100)	59013.623(66)	6.3125	5.615	535.302	[68A]
9(3, 7) - 10(2, 8)	59019.930(100)	59019.994(42)	6.3324	1.396	42.481	[64B]
4(1, 3) - 4(0, 4)	60498.730(80)	60498.862(25)	5.4974	4.201	6.356	[63A]
18(2,16) - 19(1,19)		60983.893(124)	7.1606	0.367	116.754	
26(4,22) - 25(5,21)	61526.040(100)	61526.056(81)	6.2545	4.118	251.584	[64B]
20(5,15) - 21(4,18)		62524.807(45)	6.2443	3.104	175.764	
25(6,20) - 26(5,21)	65426.890(100)	65426.855(45)	6.1830	3.880	268.349	[64B]
35(3,33) - 34(4,30)		65811.652(174)	6.6841	1.673	413.677	
6(1, 5) - 6(0, 6)	70347.950(100)	70348.071(29)	5.3395	5.552	13.304	[63A]
1(1, 1) - 0(0, 0)	70735.920(100)	70736.046(31)	5.4399	1.000	0.000	[63B]
32(5,27) - 31(6,26)	70770.640(100)	70770.732(119)	6.0719	5.053	380.206	[64B]
6(0, 6) - 5(1, 5)	71627.840(80)	71627.848(37)	5.5826	3.005	10.915	[63A]
3(2, 2) - 4(1, 3)		73161.972(34)	6.1566	0.405	8.374	
10(1, 9) - 9(2, 8)	73231.580(100)	73231.582(48)	5.8605	2.396	35.615	[64A]
30(7,23) - 31(6,26)		73558.201(54)	6.0301	4.644	380.206	
4(2, 2) - 5(1, 5)		73883.939(33)	6.1370	0.529	10.915	
33(5,29) - 32(6,26)		74868.593(104)	6.0020	5.166	400.799	
14(4,10) - 15(3,13)		77863.431(44)	5.9733	2.122	92.420	
19(5,15) - 20(4,16)		78711.366(49)	5.9512	2.907	162.411	
35(8,28) - 36(7,29)		79329.370(78)	5.9312	5.411	511.560	
30(3,27) - 31(2,30)		81040.535(238)	6.7983	0.593	316.544	
38(6,32) - 37(7,31)		81598.475(185)	5.8851	6.004	535.302	
25(3,23) - 24(4,20)		82488.374(99)	5.9538	3.283	220.527	
8(1, 7) - 8(0, 8)		85208.074(36)	5.1448	6.398	22.710	
24(6,18) - 25(5,21)		88028.970(52)	5.8034	3.669	251.584	
29(4,26) - 28(5,23)		88888.862(112)	5.7937	4.390	303.756	
33(3,31) - 32(4,28)		90496.913(192)	6.1544	2.057	369.522	
13(4,10) - 14(3,11)		91400.924(49)	5.7752	1.927	83.005	
8(3, 5) - 9(2, 8)	92660.315(50)	92660.351(42)	5.7879	1.131	35.615	[78A]
29(7,23) - 30(6,24)	93456.655(50)	93456.492(68)	5.7235	4.438	360.325	[78A]
39(6,34) - 38(7,31)		93474.314(165)	5.7087	6.150	559.728	
20(2,18) - 21(1,21)		94032.741(179)	6.7553	0.282	141.359	
16(2,14) - 15(3,13)		98264.740(68)	5.5780	2.987	92.420	
27(3,25) - 26(4,22)		99177.394(134)	5.7660	3.139	253.636	
34(8,26) - 35(7,29)		100215.057(106)	5.6314	5.203	488.447	
18(5,13) - 19(4,16)		102335.186(53)	5.6202	2.689	149.463	
7(3, 5) - 8(2, 6)		103699.708(48)	5.6673	0.940	30.130	
31(3,29) - 30(4,26)		104210.661(188)	5.8646	2.469	328.121	
2(2, 0) - 3(1, 3)		104518.054(45)	5.9461	0.161	5.417	
3(1, 3) - 2(0, 2)		105117.157(47)	4.9876	2.015	1.911	
10(1, 9) - 10(0,10)		105956.738(45)	4.9304	6.733	34.523	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $\nu_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
39(9,31) - 40(8,32)		106223.402(185)	5.5546	5.969	635.993	
29(3,27) - 28(4,24)		106870.639(166)	5.7407	2.852	289.493	
23(6,18) - 24(5,19)		107251.253(62)	5.5534	3.460	235.574	
22(3,19) - 21(4,18)		110003.786(89)	5.4749	3.682	175.764	
35(5,31) - 34(6,28)		114050.794(180)	5.4558	5.445	443.895	
28(7,21) - 29(6,24)		114467.206(90)	5.4655	4.227	341.054	
8(0, 8) - 7(1, 7)		115933.912(54)	4.8878	4.590	18.843	
28(4,24) - 27(5,23)		116163.380(141)	5.4189	4.505	285.618	
12(4, 8) - 13(3,11)		116235.826(52)	5.4829	1.701	73.866	
33(8,26) - 34(7,27)		120488.074(152)	5.3964	4.994	465.998	
31(4,28) - 30(5,25)		120564.282(172)	5.4126	4.517	341.819	
17(5,13) - 18(4,14)		120569.507(59)	5.4179	2.478	137.335	
34(5,29) - 33(6,28)		122226.491(236)	5.3561	5.411	421.959	
12(1,11) - 11(2,10)		126111.666(62)	5.0805	3.365	48.929	
38(9,29) - 39(8,32)		126720.599(259)	5.3291	5.760	610.339	
22(6,16) - 23(5,19)		128461.085(78)	5.3273	3.246	220.145	
6(3, 3) - 7(2, 6)		129050.553(55)	5.4415	0.711	24.816	
32(3,29) - 33(2,32)		129157.360(389)	6.3018	0.490	356.404	
40(6,34) - 39(7,33)		130340.912(371)	5.2722	6.353	584.758	
12(2,10) - 12(1,11)	131530.510(100)	131530.479(45)	4.5575	9.888	53.136	[64C]
10(2, 8) - 10(1, 9)	132594.390(100)	132594.576(48)	4.5758	7.773	38.058	[64A]
12(1,11) - 12(0,12)	133003.550(100)	133003.582(56)	4.7129	6.687	48.700	[64C]
11(4, 8) - 12(3, 9)	133271.680(100)	133271.713(59)	5.3263	1.489	65.625	[64C]
22(2,20) - 23(1,23)		133645.514(269)	6.4397	0.223	168.312	
27(7,21) - 28(6,22)	134482.980(100)	134483.084(122)	5.2624	4.015	322.461	[64C]
14(2,12) - 14(1,13)	135531.580(100)	135531.590(45)	4.5092	11.717	70.746	[64C]
5(1, 5) - 4(0, 4)	136675.340(100)	136675.326(61)	4.6505	3.131	6.356	[64C]
8(2, 6) - 8(1, 7)	137234.310(100)	137234.287(53)	4.5756	5.678	25.552	[64A]
32(8,24) - 33(7,27)		140967.971(206)	5.1976	4.782	444.188	
16(5,11) - 17(4,14)	142044.090(100)	142044.320(69)	5.2190	2.259	125.745	[64C]
6(2, 4) - 6(1, 5)		143663.779(59)	4.5710	3.825	15.650	
5(3, 3) - 6(2, 4)		145331.285(62)	5.3630	0.505	20.442	
16(2,14) - 16(1,15)		145740.037(51)	4.4256	13.000	90.837	
37(9,29) - 38(8,30)		146992.758(351)	5.1406	5.549	585.337	
33(4,30) - 32(5,27)		147129.934(244)	5.1803	4.512	382.567	
21(6,16) - 22(5,17)		148089.244(97)	5.1520	3.031	205.412	
4(2, 2) - 4(1, 3)		150060.402(63)	4.5812	2.270	8.374	
37(5,33) - 36(6,30)		151196.889(283)	5.0958	5.656	489.629	
2(2, 0) - 2(1, 1)		154896.346(67)	4.7010	0.870	3.737	
10(4, 6) - 11(3, 9)		154925.377(67)	5.1606	1.268	57.875	
26(7,19) - 27(6,22)		154937.348(159)	5.0857	3.800	304.498	
18(2,16) - 17(3,15)		157562.746(81)	4.9190	3.704	113.532	
10(0,10) - 9(1, 9)		159887.246(67)	4.4155	6.413	29.190	
31(8,24) - 32(7,25)		161118.482(272)	5.0298	4.569	423.033	
15(5,11) - 16(4,12)		161153.734(81)	5.0713	2.042	114.877	
3(2, 2) - 3(1, 3)		161799.213(69)	4.5708	1.442	5.417	
18(2,16) - 18(1,17)		162976.660(62)	4.3093	13.626	113.352	
14(1,13) - 14(0,14)		165963.764(68)	4.5042	6.457	65.210	
7(1, 7) - 6(0, 6)		166061.041(72)	4.3811	4.425	13.304	
4(3, 1) - 5(2, 4)		166507.898(71)	5.3206	0.303	16.546	
35(4,32) - 34(5,29)		166835.070(320)	5.0574	4.352	426.036	
36(9,27) - 37(8,30)		167249.008(454)	4.9776	5.337	560.979	
20(6,14) - 21(5,17)		168508.811(120)	4.9954	2.813	191.298	
5(2, 4) - 5(1, 5)		168826.191(69)	4.4803	2.458	10.915	
24(3,21) - 23(4,20)		171566.920(129)	4.8748	4.207	204.648	
9(4, 6) - 10(3, 7)		173495.895(76)	5.0506	1.052	50.867	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $\nu_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
25(7,19) - 26(6,20)		174901.006(202)	4.9365	3.584	287.195	
30(4,26) - 29(5,25)		176012.836(243)	4.8696	4.909	322.249	
37(4,34) - 36(5,31)		177865.947(390)	5.0305	4.036	472.262	
24(2,22) - 25(1,25)		178188.020(398)	6.1884	0.182	197.612	
36(5,31) - 35(6,30)		178277.113(422)	4.8617	5.758	466.315	
39(4,36) - 38(5,33)		178611.619(444)	5.0979	3.595	521.275	
7(2, 6) - 7(1, 7)		179076.303(69)	4.4093	3.307	18.843	
14(1,13) - 13(2,12)		179941.189(73)	4.5499	4.560	64.744	
34(3,31) - 35(2,34)		181262.887(594)	5.9560	0.417	398.607	
30(8,22) - 31(7,25)		181308.232(344)	4.8829	4.354	402.522	
14(5, 9) - 15(4,12)		181501.930(95)	4.9369	1.822	104.610	
3(3, 1) - 4(2, 2)		184956.688(80)	5.4527	0.127	13.379	
39(5,35) - 38(6,32)		185155.033(406)	4.8455	5.772	538.024	
35(9,27) - 36(8,28)		187360.357(570)	4.8354	5.122	537.270	
20(2,18) - 20(1,19)	187636.970(100)	187637.055(77)	4.1691	13.662	138.236	[74A]
19(6,14) - 20(5,15)		188212.773(146)	4.8646	2.595	177.850	
9(2, 8) - 9(1, 9)	192612.430(100)	192612.402(70)	4.3336	4.008	29.190	[74A]
8(4, 4) - 9(3, 7)		193630.801(86)	4.9582	0.838	44.449	
9(1, 9) - 8(0, 8)		194268.852(81)	4.1509	5.948	22.710	
24(7,17) - 25(6,20)		194994.176(249)	4.8046	3.367	270.532	
2(2, 0) - 1(1, 1)		196177.869(86)	4.1631	1.478	2.360	
22(3,19) - 22(2,20)		199757.035(130)	4.0172	17.631	172.770	
13(5, 9) - 14(4,10)		200888.303(109)	4.8290	1.604	95.018	
29(8,22) - 30(7,23)		201308.469(423)	4.7542	4.137	382.660	
20(3,17) - 20(2,18)	201972.180(100)	201972.059(111)	4.0224	15.356	144.495	[74A]
12(0,12) - 11(1,11)	202562.470(100)	202562.277(78)	4.0654	8.407	41.943	[74A]
16(1,15) - 16(0,16)	203652.700(100)	203652.393(88)	4.3107	6.209	84.044	[74A]
24(3,21) - 24(2,22)	204331.670(100)	204331.744(154)	3.9830	19.409	203.555	[74A]
34(9,25) - 35(8,28)		207420.967(694)	4.7091	4.907	514.207	
18(6,12) - 19(5,15)		208172.406(173)	4.7488	2.376	165.037	
18(3,15) - 18(2,16)		209433.742(98)	4.0058	12.912	118.788	
11(2,10) - 11(1,11)		209454.195(73)	4.2509	4.564	41.943	
3(2, 2) - 2(1, 1)		212177.502(92)	4.1549	1.667	3.737	
7(4, 4) - 8(3, 5)		212726.123(96)	4.9047	0.630	38.706	
39(10,30) - 40(9,31)		213246.574(1100)	4.6686	5.676	665.152	
23(7,17) - 24(6,18)		214835.947(299)	4.6894	3.149	254.520	
26(3,23) - 26(2,24)		216758.568(183)	3.9170	20.470	236.787	
20(2,18) - 19(3,17)		218995.898(101)	4.4415	4.590	137.190	
22(2,20) - 22(1,21)		219465.564(102)	4.0165	13.319	165.450	
16(3,13) - 16(2,14)		220165.240(90)	3.9768	10.598	95.698	
12(5, 7) - 13(4,10)		220657.850(125)	4.7366	1.387	86.054	
28(8,20) - 29(7,23)		221277.992(507)	4.6395	3.920	363.443	
11(1,11) - 10(0,10)		222424.385(88)	3.9456	7.697	34.523	
26(2,24) - 27(1,27)		225833.365(570)	5.9843	0.155	229.254	
33(9,25) - 34(8,26)		227378.645(827)	4.5963	4.691	491.789	
17(6,12) - 18(5,13)		227808.338(202)	4.6492	2.157	152.876	
13(2,12) - 13(1,13)		229545.207(79)	4.1629	4.985	57.087	
14(3,11) - 14(2,12)		231980.484(86)	3.9442	8.581	75.267	
6(4, 2) - 7(3, 5)		232210.221(106)	4.8912	0.433	33.589	
38(10,28) - 39(9,31)		233213.531(1298)	4.5577	5.460	639.537	
16(1,15) - 15(2,14)		233724.926(84)	4.1448	6.018	83.041	
22(7,15) - 23(6,18)		234679.006(351)	4.5867	2.930	239.152	
36(3,33) - 37(2,36)		235342.352(860)	5.6970	0.366	443.151	
26(3,23) - 25(4,22)		237062.285(196)	4.4265	4.842	236.109	
28(3,25) - 28(2,26)		237602.139(219)	3.8226	20.777	272.402	
4(2, 2) - 3(1, 3)		238697.643(102)	4.0978	1.717	5.417	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $\nu_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
38(5,33) - 37(6,32)		239752.180(687)	4.4730	6.111	513.278	
11(5, 7) - 12(4, 8)		240057.410(141)	4.6636	1.172	77.743	
27(8,20) - 28(7,21)		241126.754(596)	4.5369	3.702	344.872	
32(4,28) - 31(5,27)		241193.633(390)	4.4483	5.363	361.477	
12(3, 9) - 12(2,10)		242872.805(85)	3.9157	6.884	57.523	
14(0,14) - 13(1,13)		243522.635(86)	3.7940	10.483	57.087	
18(1,17) - 18(0,18)		244386.477(122)	4.1358	6.025	105.200	
5(2, 4) - 4(1, 3)		245002.656(104)	4.0585	2.124	8.374	
32(9,23) - 33(8,26)		247275.186(967)	4.4945	4.473	470.017	
16(6,10) - 17(5,13)		247485.443(232)	4.5621	1.938	141.357	
5(4, 2) - 6(3, 3)		251401.277(117)	4.9485	0.253	29.121	
10(3, 7) - 10(2, 8)		251428.459(89)	3.8976	5.435	42.481	
13(1,13) - 12(0,12)		251450.133(93)	3.7588	9.615	48.700	
15(2,14) - 15(1,15)		252730.938(91)	4.0718	5.289	74.610	
37(10,28) - 38(9,29)		253107.303(1508)	4.4572	5.244	614.566	
21(7,15) - 22(6,16)		254381.104(406)	4.4957	2.710	224.430	
8(3, 5) - 8(2, 6)		257099.244(95)	3.8955	4.134	30.130	
24(2,22) - 24(1,23)		257420.244(144)	3.8616	12.840	194.969	
10(5, 5) - 11(4, 8)		259525.488(157)	4.6085	0.961	70.070	
6(3, 3) - 6(2, 4)		260176.047(103)	3.9185	2.893	20.442	
26(8,18) - 27(7,21)		260920.957(687)	4.4445	3.483	326.946	
4(3, 1) - 4(2, 2)		261450.152(109)	4.0064	1.612	13.379	
3(3, 1) - 3(2, 2)		261855.119(111)	4.1528	0.891	10.814	
5(3, 3) - 5(2, 4)		262144.793(106)	3.9433	2.260	16.546	
7(3, 5) - 7(2, 6)		262999.680(100)	3.8869	3.476	24.816	
32(4,28) - 32(3,29)		264129.305(420)	3.6529	25.484	360.712	
9(3, 7) - 9(2, 8)		264846.152(93)	3.8545	4.646	35.615	
30(4,26) - 30(3,27)		266030.289(376)	3.6569	23.194	319.247	
30(3,27) - 30(2,28)		266815.348(268)	3.7071	20.487	310.347	
15(6,10) - 16(5,11)		267006.727(263)	4.4877	1.721	130.484	
31(9,23) - 32(8,24)		267092.133(1112)	4.4022	4.255	448.890	
11(3, 9) - 11(2,10)		268169.750(88)	3.8261	5.782	48.929	
34(4,30) - 34(3,31)		270527.617(465)	3.6211	27.091	404.654	
4(4, 0) - 5(3, 3)		270633.648(127)	5.1627	0.101	25.290	
36(10,26) - 37(9,29)		272940.418(1726)	4.3656	5.026	590.240	
13(3,11) - 13(2,12)		273467.363(86)	3.7954	6.871	64.744	
20(7,13) - 21(6,16)		274039.730(461)	4.4147	2.491	210.352	
28(2,26) - 29(1,29)		274745.570(786)	5.8170	0.136	263.237	
28(4,24) - 28(3,25)		274778.266(330)	3.6381	20.539	280.327	
7(2, 6) - 6(1, 5)		274789.273(113)	3.9441	2.671	15.650	
17(2,16) - 17(1,17)		278754.945(116)	3.9799	5.499	94.502	
9(5, 5) - 10(4, 6)		278849.523(173)	4.5753	0.757	63.042	
25(8,18) - 26(7,19)		280629.422(782)	4.3612	3.263	309.666	
15(3,13) - 15(2,14)		281200.223(89)	3.7595	7.882	83.041	
22(2,20) - 21(3,19)		281511.613(136)	4.0612	5.693	163.380	
15(1,15) - 14(0,14)		281814.242(99)	3.5878	11.626	65.210	
16(0,16) - 15(1,15)		282803.473(95)	3.5762	12.578	74.610	
6(2, 4) - 5(1, 5)		285639.699(118)	3.9846	1.878	10.915	
36(4,32) - 36(3,33)		286094.398(516)	3.5607	27.853	451.001	
18(1,17) - 17(2,16)		286339.039(98)	3.8203	7.745	103.800	
20(1,19) - 20(0,20)		286432.613(177)	3.9812	5.920	128.682	
14(6, 8) - 15(5,11)		286497.855(293)	4.4250	1.506	120.252	
30(9,21) - 31(8,24)		286848.465(1263)	4.3181	4.036	428.408	
26(4,22) - 26(3,23)		288378.977(286)	3.6041	17.866	244.017	
38(3,35) - 39(2,38)		289523.113(1199)	5.4958	0.329	490.033	
17(3,15) - 17(2,16)		291752.953(101)	3.7170	8.786	103.800	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $v_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
35(10,26) - 36(9,27)		292711.066(1953)	4.2817	4.808	566.558	
19(7,13) - 20(6,14)		293608.871(517)	4.3429	2.273	196.918	
8(5, 3) - 9(4, 6)		298152.492(189)	4.5693	0.562	56.655	
26(2,24) - 26(1,25)		299800.387(211)	3.7119	12.408	226.786	
24(8,16) - 25(7,19)		300279.750(878)	4.2859	3.044	293.029	
9(2, 8) - 8(1, 7)		301673.180(119)	3.8316	3.314	25.552	
32(3,29) - 32(2,30)		303591.688(339)	3.5797	19.869	350.585	
24(4,20) - 24(3,21)		304474.781(245)	3.5628	15.434	210.371	
19(3,17) - 19(2,18)		305401.863(122)	3.6678	9.560	127.003	
28(3,25) - 27(4,24)		305455.113(292)	4.0619	5.637	270.138	
13(6, 8) - 14(5, 9)		305903.578(323)	4.3746	1.294	110.665	
29(9,21) - 30(8,22)		306539.672(1417)	4.2414	3.817	408.569	
40(5,35) - 39(6,34)		307068.094(1037)	4.1459	6.498	562.846	
19(2,18) - 19(1,19)		307274.582(159)	3.8891	5.639	116.754	
38(4,34) - 38(3,35)		311072.535(584)	3.4754	27.820	499.690	
34(4,30) - 33(5,29)		311218.527(585)	4.0998	5.912	403.296	
34(10,24) - 35(9,27)		312426.164(2186)	4.2046	4.589	543.520	
18(7,11) - 19(6,14)		313125.242(574)	4.2799	2.055	184.128	
17(1,17) - 16(0,16)		313536.617(107)	3.4312	13.671	84.044	
7(5, 3) - 8(4, 4)		317392.012(204)	4.6035	0.380	50.908	
39(11,29) - 40(10,30)		317955.473(3249)	4.1730	5.361	697.857	
3(3, 1) - 2(2, 0)		319136.277(136)	3.4486	2.491	8.903	
23(8,16) - 24(7,17)		319863.988(976)	4.2179	2.825	277.036	
22(4,18) - 22(3,19)		320702.543(207)	3.5214	13.343	179.434	
18(0,18) - 17(1,17)		320707.508(107)	3.3955	14.660	94.502	
21(3,19) - 21(2,20)		322293.727(154)	3.6122	10.192	152.630	
30(2,28) - 31(1,31)		323351.520(1048)	5.6797	0.123	299.561	
12(6, 6) - 13(5, 9)		325264.914(353)	4.3373	1.086	101.719	
11(2,10) - 10(1, 9)		325921.840(124)	3.7233	4.082	38.058	
28(9,19) - 29(8,22)		326175.211(1574)	4.1713	3.597	389.375	
40(5,35) - 40(4,36)		327134.141(990)	3.3827	31.144	562.176	
22(1,21) - 22(0,22)		328421.512(255)	3.8469	5.873	154.495	
33(10,24) - 34(9,25)		332087.000(2424)	4.1336	4.370	521.125	
17(7,11) - 18(6,12)		332578.141(630)	4.2254	1.840	171.980	
20(4,16) - 20(3,17)		335128.504(172)	3.4854	11.573	151.232	
38(5,33) - 38(4,34)		336030.641(924)	3.3659	28.392	510.066	
6(5, 1) - 7(4, 4)		336599.551(219)	4.7074	0.217	45.802	
20(1,19) - 19(2,18)		336760.707(123)	3.5559	9.699	127.003	
38(11,27) - 39(10,30)		337622.828(3595)	4.1018	5.142	672.265	
21(2,20) - 21(1,21)		337892.203(221)	3.8009	5.728	141.359	
4(3, 1) - 3(2, 2)		338348.582(142)	3.4637	2.595	10.814	
8(2, 6) - 7(1, 7)		338376.273(134)	3.8833	1.865	18.843	
22(8,14) - 23(7,17)		339394.559(1074)	4.1567	2.607	261.687	
23(3,21) - 23(2,22)		342435.883(197)	3.5514	10.685	180.661	
24(2,22) - 23(3,21)		343923.816(192)	3.7440	7.057	192.083	
11(6, 6) - 12(5, 7)		344572.438(381)	4.3154	0.884	93.414	
28(2,26) - 28(1,27)		344613.570(305)	3.5728	12.103	260.907	
40(4,36) - 40(3,37)		344972.238(683)	3.3720	27.223	550.669	
27(9,19) - 28(8,20)		345755.875(1734)	4.1071	3.378	370.824	
34(3,31) - 34(2,32)		346364.840(439)	3.4490	19.190	393.100	
19(1,19) - 18(0,18)		346379.242(122)	3.2877	15.720	105.200	
18(4,14) - 18(3,15)		346591.758(142)	3.4589	10.037	125.774	
13(2,12) - 12(1,11)		347991.758(128)	3.6181	5.016	53.136	
36(5,31) - 36(4,32)		351288.773(834)	3.3322	25.459	460.544	
32(10,22) - 33(9,25)		351698.066(2667)	4.0680	4.150	499.374	
16(7, 9) - 17(6,12)		351982.363(685)	4.1795	1.626	160.475	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $\nu_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
16(4,12) - 16(3,13)		354799.957(120)	3.4433	8.651	103.042	
5(5, 1) - 6(4, 2)		355774.410(232)	4.9725	0.085	41.335	
5(3, 3) - 4(2, 2)		357087.047(147)	3.4562	2.746	13.379	
37(11,27) - 38(10,28)		357243.598(3947)	4.0357	4.923	647.316	
20(0,20) - 19(1,19)		357602.676(128)	3.2410	16.724	116.754	
21(8,14) - 22(7,15)		358871.840(1172)	4.1021	2.389	246.980	
14(4,10) - 14(3,11)		360132.996(110)	3.4383	7.353	83.005	
12(4, 8) - 12(3, 9)		363291.660(113)	3.4431	6.107	65.625	
10(6, 4) - 11(5, 7)		363840.711(408)	4.3127	0.689	85.750	
10(4, 6) - 10(3, 7)		364993.930(123)	3.4582	4.885	50.867	
26(9,17) - 27(8,20)		365287.277(1894)	4.0486	3.159	352.915	
13(4,10) - 13(3,11)		365386.824(110)	3.4288	6.700	73.866	
15(4,12) - 15(3,13)		365447.590(112)	3.4158	7.923	92.420	
11(4, 8) - 11(3, 9)		365616.910(117)	3.4451	5.487	57.875	
25(3,23) - 25(2,24)		365698.801(255)	3.4866	11.052	211.080	
8(4, 4) - 8(3, 5)		365816.602(136)	3.4891	3.658	38.706	
9(4, 6) - 9(3, 7)		365904.359(129)	3.4697	4.273	44.449	
7(4, 4) - 7(3, 5)		366125.660(143)	3.5156	3.029	33.589	
17(4,14) - 17(3,15)		366145.102(126)	3.4033	9.152	113.532	
6(4, 2) - 6(3, 3)		366159.344(149)	3.5587	2.377	29.121	
5(4, 2) - 5(3, 3)		366246.039(155)	3.6356	1.683	25.290	
4(4, 0) - 4(3, 1)		366270.543(160)	3.8129	0.915	22.100	
19(4,16) - 19(3,17)		367918.809(152)	3.3895	10.377	137.190	
15(2,14) - 14(1,13)		368581.418(135)	3.5138	6.161	70.746	
24(1,23) - 24(0,24)		369561.152(356)	3.7311	5.859	182.641	
23(2,22) - 23(1,23)		370193.559(305)	3.7164	5.784	168.312	
34(5,29) - 34(4,30)		370497.195(732)	3.2887	22.671	413.677	
32(2,30) - 33(1,33)		370586.684(1356)	5.5675	0.112	338.224	
31(10,22) - 32(9,23)		371261.730(2913)	4.0075	3.931	478.265	
21(4,18) - 21(3,19)		371264.863(189)	3.3727	11.574	163.380	
15(7, 9) - 16(6,10)		371338.617(739)	4.1426	1.416	149.612	
30(3,27) - 29(4,26)		375502.961(417)	3.7512	6.639	306.721	
23(4,20) - 23(3,21)		376688.641(234)	3.3516	12.714	192.083	
36(11,25) - 37(10,28)		376820.652(4307)	3.9742	4.704	623.009	
6(3, 3) - 5(2, 4)		376989.555(151)	3.4336	2.905	16.546	
20(8,12) - 21(7,15)		378302.574(1269)	4.0539	2.173	232.915	
21(1,21) - 20(0,20)		380036.930(147)	3.1562	17.763	128.682	
9(6, 4) - 10(5, 5)		383072.406(434)	4.3363	0.506	78.727	
22(1,21) - 21(2,20)		384339.777(162)	3.3390	11.800	152.630	
25(4,22) - 25(3,23)		384655.324(289)	3.3253	13.766	223.279	
25(9,17) - 26(8,18)		384771.992(2055)	3.9952	2.941	335.650	
36(4,32) - 35(5,31)		385093.828(823)	3.7986	6.605	447.699	
17(2,16) - 16(1,15)		388639.168(145)	3.4090	7.554	90.837	
30(2,28) - 30(1,29)		390028.426(425)	3.4474	11.926	297.337	
14(7, 7) - 15(6,10)		390654.359(791)	4.1158	1.210	139.390	
30(10,20) - 31(9,23)		390781.414(3162)	3.9517	3.712	457.800	
32(5,27) - 32(4,28)		391066.199(631)	3.2423	20.211	369.522	
27(3,25) - 27(2,26)		391832.039(331)	3.4193	11.312	243.874	
36(3,33) - 36(2,34)		393052.988(570)	3.3217	18.626	437.890	
22(0,22) - 21(1,21)		393810.473(160)	3.1056	18.771	141.359	
7(3, 5) - 6(2, 4)		394125.172(154)	3.4112	3.088	20.442	
27(4,24) - 27(3,25)		395545.973(353)	3.2932	14.700	256.945	
35(11,25) - 36(10,26)		396356.309(4670)	3.9170	4.484	599.344	
19(8,12) - 20(7,13)		397689.703(1365)	4.0121	1.959	219.493	
10(2, 8) - 9(1, 9)		398438.563(149)	3.8063	1.685	29.190	
8(6, 2) - 9(5, 5)		402274.691(458)	4.3999	0.338	72.344	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $\nu_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
25(2,24) - 25(1,25)		403784.121(113)	3.6360	5.820	197.612	
24(9,15) - 25(8,18)		404214.055(2215)	3.9470	2.723	319.027	
26(2,24) - 25(3,23)		404959.039(268)	3.4743	8.700	223.279	
19(2,18) - 18(1,17)		409267.348(163)	3.3030	9.200	113.352	
26(1,25) - 26(0,26)		409589.367(480)	3.6312	5.859	213.124	
29(4,26) - 29(3,27)		409624.055(428)	3.2552	15.497	293.058	
13(7, 7) - 14(6, 8)		409933.258(842)	4.1006	1.010	129.809	
29(10,20) - 30(9,21)		410259.754(3411)	3.9002	3.493	437.976	
30(5,25) - 30(4,26)		410661.285(538)	3.1985	18.115	328.121	
23(1,23) - 22(0,22)		414241.563(184)	3.0355	19.797	154.495	
34(11,23) - 35(10,26)		415853.086(5038)	3.8639	4.265	576.322	
34(2,32) - 35(1,35)		415973.141(1713)	5.4756	0.104	379.225	
8(3, 5) - 7(2, 6)		416399.215(158)	3.3746	3.229	24.816	
18(8,10) - 19(7,13)		417037.855(1459)	3.9769	1.748	206.712	
29(3,27) - 29(2,28)		420492.539(427)	3.3511	11.490	279.032	
39(12,28) - 40(11,29)		421013.836(7197)	3.8343	5.037	734.041	
7(6, 2) - 8(5, 3)		421452.262(480)	4.5345	0.190	66.600	
23(9,15) - 24(8,16)		423616.461(2374)	3.9038	2.507	303.045	
31(4,28) - 31(3,29)		427014.902(516)	3.2117	16.147	331.597	
28(5,23) - 28(4,24)		427605.828(456)	3.1617	16.321	289.493	
24(1,23) - 23(2,22)		428939.457(217)	3.1598	13.964	180.661	
12(7, 5) - 13(6, 8)		429180.332(890)	4.0996	0.817	120.868	
9(3, 7) - 8(2, 6)		429285.047(159)	3.3556	3.441	30.130	
24(0,24) - 23(1,23)		429571.863(206)	2.9847	20.806	168.312	
28(10,18) - 29(9,21)		429699.652(3660)	3.8530	3.275	418.795	
21(2,20) - 20(1,19)		431496.520(190)	3.1964	11.064	138.236	
32(2,30) - 32(1,31)		434729.074(572)	3.3367	11.840	336.084	
33(11,23) - 34(10,24)		435313.250(5408)	3.8144	4.045	553.941	
17(8,10) - 18(7,11)		436350.496(1551)	3.9488	1.540	194.573	
27(2,26) - 27(1,27)		438316.266(545)	3.5602	5.843	229.254	
38(12,26) - 39(11,29)		440477.762(7721)	3.7836	4.818	708.463	
6(6, 0) - 7(5, 3)		440610.090(500)	4.8333	0.072	61.495	
26(5,21) - 26(4,22)		441089.254(382)	3.1340	14.737	253.636	
38(3,35) - 38(2,36)		441480.871(736)	3.2026	18.240	484.964	
4(4, 0) - 3(3, 1)		442764.008(189)	2.9845	3.491	19.549	
22(9,13) - 23(8,16)		442982.555(2530)	3.8655	2.293	287.706	
32(3,29) - 31(4,28)		445836.664(568)	3.4799	7.895	345.840	
33(4,30) - 33(3,31)		447699.219(621)	3.1634	16.654	372.541	
11(7, 5) - 12(6, 6)		448399.586(935)	4.1173	0.633	112.568	
28(1,27) - 28(0,28)		448574.965(627)	3.5440	5.864	245.944	
25(1,25) - 24(0,24)		448793.379(237)	2.9243	21.824	182.641	
27(10,18) - 28(9,19)		449103.703(3908)	3.8098	3.057	400.255	
24(5,19) - 24(4,20)		451095.141(315)	3.1157	13.287	220.527	
31(3,29) - 31(2,30)		451281.484(548)	3.2831	11.607	316.544	
32(11,21) - 33(10,24)		454739.078(5778)	3.7685	3.827	532.203	
16(8, 8) - 17(7,11)		455631.371(1639)	3.9287	1.336	183.074	
23(2,22) - 22(1,21)		456013.609(229)	3.0904	13.077	165.450	
10(3, 7) - 9(2, 8)		457254.617(162)	3.3090	3.504	35.615	
22(5,17) - 22(4,18)		458117.891(254)	3.1057	11.921	190.131	
36(2,34) - 37(1,37)		459502.570(2125)	5.3999	0.097	422.563	
37(12,26) - 38(11,27)		459909.387(8248)	3.7362	4.598	683.527	
38(4,34) - 37(5,33)		461496.570(1099)	3.5312	7.493	494.672	
11(3, 9) - 10(2, 8)		461497.012(162)	3.3023	3.790	42.481	
5(4, 2) - 4(3, 1)		461882.930(191)	3.0065	3.573	22.100	
21(9,13) - 22(8,14)		462315.285(2684)	3.8323	2.080	273.007	
20(5,15) - 20(4,16)		462842.297(200)	3.1024	10.612	162.411	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $\nu_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
28(2,26) - 27(3,25)		463398.945(365)	3.2442	10.606	256.945	
25(5,21) - 25(4,22)		463915.207(351)	3.0797	13.815	236.109	
27(5,23) - 27(4,24)		464069.996(425)	3.0728	15.121	270.138	
23(5,19) - 23(4,20)		464584.613(284)	3.0853	12.512	204.648	
26(0,26) - 25(1,25)		465052.207(267)	2.8750	22.832	197.612	
29(5,25) - 29(4,26)		465520.414(508)	3.0637	16.410	306.721	
21(5,17) - 21(4,18)		465677.922(225)	3.0908	11.225	175.764	
18(5,13) - 18(4,14)		465921.047(159)	3.1045	9.344	137.335	
19(5,15) - 19(4,16)		466889.020(177)	3.0969	9.959	149.463	
12(2,10) - 11(1,11)		467096.340(164)	3.7543	1.403	41.943	
10(7, 3) - 11(6, 6)		467595.059(977)	4.1611	0.461	104.908	
16(5,11) - 16(4,12)		467876.309(137)	3.1112	8.104	114.877	
17(5,13) - 17(4,14)		468012.652(145)	3.1047	8.716	125.745	
26(10,16) - 27(9,19)		468474.508(4155)	3.7705	2.841	382.357	
31(5,27) - 31(4,28)		468772.336(603)	3.0513	17.657	345.840	
15(5,11) - 15(4,12)		468936.082(136)	3.1153	7.490	104.610	
14(5, 9) - 14(4,10)		469086.090(140)	3.1227	6.882	95.018	
13(5, 9) - 13(4,10)		469620.375(149)	3.1304	6.273	86.054	
12(5, 7) - 12(4, 8)		469808.852(161)	3.1408	5.664	77.743	
11(5, 7) - 11(4, 8)		470077.359(175)	3.1537	5.050	70.070	
10(5, 5) - 10(4, 6)		470217.023(189)	3.1707	4.429	63.042	
9(5, 5) - 9(4, 6)		470347.559(204)	3.1939	3.796	56.655	
8(5, 3) - 8(4, 4)		470426.051(218)	3.2272	3.144	50.908	
7(5, 3) - 7(4, 4)		470482.488(232)	3.2789	2.462	45.802	
6(5, 1) - 6(4, 2)		470514.992(244)	3.3688	1.734	41.335	
5(5, 1) - 5(4, 2)		470532.480(255)	3.5660	0.932	37.507	
26(1,25) - 25(2,24)		470857.457(286)	3.0097	16.130	211.080	
35(4,32) - 35(3,33)		471520.617(747)	3.1113	17.032	415.873	
29(2,28) - 29(1,29)		473504.074(703)	3.4889	5.858	263.237	
31(11,21) - 32(10,22)		474132.730(6148)	3.7261	3.608	511.105	
33(5,29) - 33(4,30)		474321.551(710)	3.0348	18.830	387.475	
15(8, 8) - 16(7, 9)		474883.816(1724)	3.9178	1.137	172.216	
34(2,32) - 34(1,33)		478035.680(745)	3.2402	11.806	377.155	
36(12,24) - 37(11,27)		479310.570(8779)	3.6918	4.379	659.232	
40(6,34) - 40(5,35)		480203.523(1446)	2.9787	24.958	573.088	
6(4, 2) - 5(3, 3)		481004.105(192)	3.0109	3.701	25.290	
20(9,11) - 21(8,14)		481617.594(2835)	3.8045	1.870	258.950	
35(5,31) - 35(4,32)		482608.527(832)	3.0134	19.899	431.601	
25(2,24) - 24(1,23)		483016.344(282)	2.9866	15.164	194.969	
27(1,27) - 26(0,26)		483356.387(304)	2.8214	23.845	213.124	
33(3,31) - 33(2,32)		483783.578(697)	3.2164	11.683	356.404	
30(1,29) - 30(0,30)		486721.672(799)	3.4666	5.870	281.102	
9(7, 3) - 10(6, 4)		486770.398(1016)	4.2454	0.304	97.887	
25(10,16) - 26(9,17)		487814.516(4398)	3.7353	2.626	365.100	
40(3,37) - 40(2,38)		489816.078(943)	3.0946	18.014	534.331	
13(3,11) - 12(2,10)		489928.641(168)	3.2545	4.152	57.523	
30(11,19) - 31(10,22)		493496.316(6517)	3.6869	3.391	490.649	
37(5,33) - 37(4,34)		493978.895(972)	2.9868	20.840	478.195	
14(8, 6) - 15(7, 9)		494111.102(1806)	3.9178	0.944	161.998	
37(4,34) - 37(3,35)		498206.359(900)	3.0565	17.303	461.577	
35(12,24) - 36(11,25)		498683.102(9310)	3.6504	4.161	635.578	
7(4, 4) - 6(3, 3)		500074.785(192)	3.0049	3.853	29.121	
28(0,28) - 27(1,27)		500358.719(343)	2.7744	24.853	229.254	
12(3, 9) - 11(2,10)		500514.949(167)	3.2451	3.684	48.929	
19(9,11) - 20(8,12)		500892.246(2982)	3.7825	1.664	245.534	
38(2,36) - 39(1,39)		501429.352(2598)	5.3363	0.091	468.238	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $\nu_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
38(6,32) - 38(5,33)		502110.871(1222)	2.9360	22.899	521.275	
8(7, 1) - 9(6, 4)		505929.027(1052)	4.4019	0.169	91.505	
24(10,14) - 25(9,17)		507126.113(4638)	3.7041	2.413	348.484	
39(5,35) - 39(4,36)		508654.285(1133)	2.9550	21.635	527.233	
31(2,30) - 31(1,31)		509126.332(887)	3.4221	5.869	299.561	
28(1,27) - 27(2,26)		510617.418(371)	2.8815	18.274	243.874	
27(2,26) - 26(1,25)		512283.285(351)	2.8863	17.270	226.786	
29(11,19) - 30(10,20)		512831.859(6883)	3.6510	3.175	470.835	
13(8, 6) - 14(7, 7)		513316.266(1883)	3.9316	0.759	152.421	
15(3,13) - 14(2,12)		514250.051(180)	3.2107	4.559	75.267	
34(3,31) - 33(4,30)		515012.461(741)	3.2405	9.435	387.475	
35(3,33) - 35(2,34)		517602.156(875)	3.1517	11.732	398.607	
34(12,22) - 35(11,25)		518028.715(9840)	3.6118	3.942	612.565	
30(2,28) - 29(3,27)		518311.664(478)	3.0491	12.713	293.058	
29(1,29) - 28(0,28)		518442.961(388)	2.7258	25.862	245.944	
8(4, 4) - 7(3, 5)		519216.137(192)	2.9923	4.017	33.589	
36(2,34) - 36(1,35)		519792.852(948)	3.1558	11.798	420.552	
18(9, 9) - 19(8,12)		520141.898(3124)	3.7669	1.461	232.758	
36(6,30) - 36(5,31)		520647.953(1037)	2.9009	21.110	472.262	
32(1,31) - 32(0,32)		524247.688(997)	3.3970	5.876	318.597	
7(7, 1) - 8(6, 2)		525074.094(1084)	4.7249	0.063	85.762	
23(10,14) - 24(9,15)		526411.578(4874)	3.6771	2.202	332.510	
39(4,36) - 39(3,37)		527398.531(1088)	3.0002	17.489	509.641	
3(3, 1) 2(0, 2)		528771.484(227)	7.1779	0.000	1.911	
28(11,17) - 29(10,20)		532141.328(7246)	3.6183	2.959	451.661	
12(8, 4) - 13(7, 7)		532502.188(1955)	3.9640	0.584	143.483	
17(3,15) - 16(2,14)		534652.086(202)	3.1679	5.054	95.698	
34(6,28) - 34(5,29)		535392.805(885)	2.8745	19.500	426.036	
30(0,30) - 29(1,29)		535558.188(435)	2.6814	26.869	263.237	
9(4, 6) - 8(3, 5)		538090.156(191)	2.9760	4.188	38.706	
40(4,36) - 39(5,35)		538920.195(1401)	3.2900	8.624	544.200	
17(9, 9) - 18(8,10)		539369.086(3261)	3.7587	1.263	220.623	
29(2,28) - 28(1,27)		543372.070(435)	2.7902	19.370	260.907	
14(2,12) - 13(1,13)		545017.984(181)	3.7219	1.104	57.087	
33(2,32) - 33(1,33)		545021.008(1100)	3.3595	5.877	338.224	
22(10,12) - 23(9,15)		545673.109(5104)	3.6545	1.993	317.176	
32(6,26) - 32(5,27)		546582.891(759)	2.8563	18.005	382.567	
14(3,11) - 13(2,12)		547453.266(176)	3.1879	3.726	64.744	
30(1,29) - 29(2,28)		548775.781(470)	2.7696	20.387	279.032	
27(11,17) - 28(10,18)		551426.609(7604)	3.5890	2.746	433.128	
11(8, 4) - 12(7, 5)		551671.586(2023)	4.0228	0.422	135.184	
19(3,17) - 18(2,16)		551692.555(235)	3.1231	5.683	118.788	
37(3,35) - 37(2,36)		552385.109(1088)	3.0896	11.763	443.151	
31(1,31) - 30(0,30)		553398.578(488)	2.6367	27.876	281.102	
30(6,24) - 30(5,25)		554806.344(647)	2.8449	16.585	341.819	
10(4, 6) - 9(3, 7)		557402.391(190)	2.9562	4.358	44.449	
37(6,32) - 37(5,33)		557775.031(1107)	2.8188	21.312	494.672	
35(6,30) - 35(5,31)		558105.484(958)	2.8230	19.945	447.699	
16(9, 7) - 17(8,10)		558576.219(3392)	3.7593	1.071	209.128	
39(6,34) - 39(5,35)		558986.242(1277)	2.8121	22.648	544.200	
33(6,28) - 33(5,29)		559489.234(826)	2.8256	18.570	403.296	
38(2,36) - 38(1,37)		560153.641(1184)	3.0815	11.800	466.279	
28(6,22) - 28(5,23)		560735.914(543)	2.8389	15.219	303.756	
34(1,33) - 34(0,34)		561335.031(1223)	3.3334	5.882	358.430	
31(6,26) - 31(5,27)		561489.102(707)	2.8274	17.204	361.477	
29(6,24) - 29(5,25)		563745.531(598)	2.8291	15.857	322.249	

TABLE 6. Measured and calculated microwave spectrum of $^{32}SO_2$ in the $v_2=1$ vibrationally excited state (MHz) — Continued

Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
21(10,12) - 22(9,13)		564912.813(5328)	3.6369	1.788	302.482	
26(6,20) - 26(5,21)		564973.406(445)	2.8370	13.896	268.349	
27(6,22) - 27(5,23)		565989.539(495)	2.8313	14.535	285.618	
5(5, 1) - 4(4, 0)		566144.867(279)	2.6420	4.492	34.318	
21(3,19) - 20(2,18)		566153.195(281)	3.0743	6.488	144.495	
5(3, 3) - 4(0, 4)		567646.313(235)	6.0611	0.002	6.356	
24(6,18) - 24(5,19)		567992.734(355)	2.8383	12.607	235.574	
25(6,20) - 25(5,21)		568042.164(400)	2.8343	13.240	251.584	
32(2,30) - 31(3,29)		569259.883(608)	2.8846	14.935	331.597	
23(6,18) - 23(5,19)		569803.484(314)	2.8386	11.970	220.145	
22(6,16) - 22(5,17)		570140.797(276)	2.8422	11.346	205.412	
26(11,15) - 27(10,18)		570689.539(7956)	3.5630	2.534	415.235	
32(0,32) - 31(1,31)		570690.938(544)	2.5948	28.882	299.561	
10(8, 2) - 11(7, 5)		570827.000(2085)	4.1226	0.277	127.525	
21(6,16) - 21(5,17)		571235.547(245)	2.8445	10.722	191.298	
20(6,14) - 20(5,15)		571661.922(222)	2.8485	10.106	177.850	
19(6,14) - 19(5,15)		572343.703(209)	2.8525	9.492	165.037	
18(6,12) - 18(5,13)		572726.242(207)	2.8576	8.882	152.876	
17(6,12) - 17(5,13)		573159.875(216)	2.8634	8.272	141.357	
16(6,10) - 16(5,11)		573453.773(233)	2.8703	7.664	130.484	
15(6,10) - 15(5,11)		573729.305(258)	2.8785	7.054	120.252	
14(6, 8) - 14(5, 9)		573932.008(285)	2.8885	6.442	110.665	
13(6, 8) - 13(5, 9)		574101.367(315)	2.9009	5.825	101.719	
12(6, 6) - 12(5, 7)		574227.445(345)	2.9164	5.200	93.414	
11(6, 6) - 11(5, 7)		574323.875(375)	2.9367	4.564	85.750	
10(6, 4) - 10(5, 5)		574392.578(404)	2.9640	3.912	78.727	
9(6, 4) - 9(5, 5)		574439.906(431)	3.0027	3.237	72.344	
8(6, 2) - 8(5, 3)		574469.758(457)	3.0615	2.529	66.600	
7(6, 2) - 7(5, 3)		574486.305(480)	3.1615	1.772	61.495	
6(6, 0) - 6(5, 1)		574493.031(501)	3.3730	0.944	57.029	
11(4, 8) - 10(3, 7)		575685.469(190)	2.9367	4.531	50.867	
31(2,30) - 30(1,29)		575803.234(538)	2.6988	21.454	297.337	
15(9, 7) - 16(8, 8)		577765.594(3517)	3.7706	0.886	198.272	
23(3,21) - 22(2,20)		578983.930(337)	3.0201	7.512	172.770	
35(2,34) - 35(1,35)		581075.094(1342)	3.3007	5.884	379.225	
36(3,33) - 35(4,32)		581607.953(930)	3.0297	11.261	431.601	
20(10,10) - 21(9,13)		584132.719(5545)	3.6245	1.587	288.429	
6(5, 1) - 5(4, 2)		585273.063(273)	2.6649	4.558	37.507	
32(1,31) - 31(2,30)		585812.297(586)	2.6697	22.475	316.544	
39(3,37) - 39(2,38)		587839.383(1337)	3.0303	11.785	490.033	
33(1,33) - 32(0,32)		588390.078(605)	2.5533	29.888	318.597	
25(11,15) - 26(10,16)		589931.883(8301)	3.5406	2.324	397.983	
9(8, 2) - 10(7, 3)		589970.797(2142)	4.2957	0.152	120.505	
25(3,23) - 24(2,22)		591294.906(403)	2.9598	8.791	203.555	
12(4, 8) - 11(3, 9)		595636.859(190)	2.9134	4.692	57.875	
14(9, 5) - 15(8, 8)		596939.391(3635)	3.7957	0.709	188.057	
36(1,35) - 36(0,36)		598118.891(1480)	3.2748	5.888	400.601	
40(2,38) - 40(1,39)		599388.867(1456)	3.0150	11.806	514.337	
16(3,13) - 15(2,14)		599630.203(193)	3.1406	3.598	83.041	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz)

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	39(7,33) - 38(8,30)		521.469(19)	12.4841	6.012	583.167	
S02 33S	12(2,10) - 11(3, 9)		590.170(70)	12.3325	1.878	57.236	
S02 V2=1	18(3,15) - 17(4,14)		851.387(56)	11.8590	2.788	125.745	
S02 V2=1	15(2,14) - 14(3,11)		1069.344(39)	11.6070	2.034	83.005	
S02 33S	28(5,23) - 27(6,22)		1677.686(106)	10.9675	4.277	301.933	
S02 33S	26(3,23) - 27(2,26)		2737.836(1267)	11.0034	0.851	243.372	
S02	27(2,26) - 26(3,23)		2838.932(42)	10.9300	0.911	243.803	
S02	43(9,35) - 44(8,36)		3045.761(22)	10.1626	6.780	743.034	
S02 34S	23(4,20) - 22(5,17)		3093.065(29)	10.1711	3.472	202.801	
S02	19(3,17) - 18(4,14)		4027.133(11)	9.8295	2.849	136.782	
S02	38(4,34) - 39(3,37)		4195.705(61)	10.4938	1.068	509.589	
S02 33S	22(5,17) - 23(4,20)		4261.522(107)	9.7286	3.483	203.498	
S02 V2=1	26(3,23) - 27(2,26)		4275.668(89)	10.3814	0.934	243.874	
S02 V2=1	18(4,14) - 19(3,17)		4332.948(43)	9.7128	2.855	137.190	
S02	11(3, 9) - 12(2,10)	4546.018(20)	4546.014(8)	9.6241	1.874	57.398	[73A]
S02 33S	32(7,25) - 33(6,28)		4783.454(169)	9.5762	5.036	419.361	
S02 V2=1	40(7,33) - 39(8,32)		5086.181(68)	9.5127	6.213	610.339	
S02	60(11,49) - 59(12,48)		5189.705(88)	9.4854	9.282	1376.490	
S02 34S	12(2,10) - 11(3, 9)		5433.932(43)	9.4275	1.882	56.942	
S02 33S	37(8,30) - 38(7,31)		5690.396(243)	9.3499	5.805	556.151	
S02 V2=1	28(6,22) - 29(5,25)		6326.633(45)	9.2115	4.470	322.249	
S02 34S	33(6,28) - 32(7,25)		6391.114(42)	9.2187	5.025	417.904	
S02	29(5,25) - 28(6,22)		6837.456(13)	9.1245	4.466	321.230	
S02	34(6,28) - 33(7,27)		6848.456(20)	9.1205	5.247	442.520	
S02 34S	21(5,17) - 22(4,18)		6991.308(40)	9.0861	3.312	188.460	
S02	15(2,14) - 14(3,11)	7169.450(100)	7169.636(12)	9.1266	2.025	82.698	[70A]
S02 34S	38(7,31) - 37(8,30)		7456.001(50)	9.0169	5.793	554.279	
S02	48(10,38) - 49(9,41)		7503.464(30)	8.9894	7.547	922.154	
S02 34S	12(2,10) - 13(1,13)		7911.733(60)	9.3527	0.724	56.859	
S02 33S	12(2,10) - 13(1,13)		8116.370(119)	9.3027	0.752	56.985	
S02 34S	26(3,23) - 27(2,26)		8283.146(486)	9.5810	0.796	242.885	
S02	12(2,10) - 13(1,13)	8420.300(200)	8420.260(21)	9.2366	0.782	57.117	[68A]
S02 V2=1	49(10,40) - 50(9,41)	8793.800(200)	8793.825(106)	8.7809	7.749	956.860	[68A]
S02 V2=1	33(7,27) - 34(6,28)	8797.400(100)	8797.399(48)	8.7824	5.250	443.895	[68A]
S02	27(6,22) - 28(5,23)	8911.000(200)	8911.097(17)	8.7666	4.285	302.957	[68A]
S02	55(10,46) - 54(11,43)	9240.700(100)	9240.780(44)	8.7289	8.513	1155.537	[68A]
S02	18(3,15) - 17(4,14)	9403.200(200)	9403.245(12)	8.7112	2.788	125.184	[68A]
S02 V2=1	35(6,30) - 34(7,27)	9509.700(100)	9509.716(58)	8.6951	5.438	465.998	[68A]
S02 33S	19(3,17) - 18(4,14)	9592.650(200)	9592.689(130)	8.7017	2.832	136.205	[64D]
S02 34S	10(2, 8) - 11(1,11)	9650.630(50)	9650.699(52)	8.9428	0.859	41.754	[59A]
S02 33S	15(2,14) - 14(3,11)		10311.430(117)	8.6591	1.997	82.376	
S02 V2=1	11(3, 9) - 12(2,10)	10527.600(100)	10527.604(46)	8.5331	1.873	57.523	[68A]
S02 34S	1(1, 1) - 2(0, 2)	10547.910(50)	10547.866(9)	8.1965	0.524	1.908	[59A]
S02 33S	10(2, 8) - 11(1,11)		10656.998(110)	8.8014	0.884	41.852	
S02 33S	1(1, 1) - 2(0, 2)	11374.581(15)	11374.556(19)	8.0987	0.523	1.910	[59A]
S02 V2=1	24(4,20) - 23(5,19)	11456.950(100)	11457.091(55)	8.4547	3.727	220.145	[68A]
S02	53(11,43) - 54(10,44)	11472.300(100)	11472.275(39)	8.4366	8.315	1120.557	[68A]
S02 34S	28(5,23) - 27(6,22)	11695.050(100)	11695.115(49)	8.4309	4.268	300.729	[64D]
S02	10(2, 8) - 11(1,11)	11788.841(20)	11788.867(15)	8.6570	0.910	41.953	[73A]
S02 V2=1	51(9,43) - 50(10,40)	11994.300(200)	11994.337(124)	8.3912	7.945	989.187	[68A]
S02	22(5,17) - 23(4,20)	12132.400(200)	12132.433(11)	8.3661	3.493	204.139	[68A]
S02	1(1, 1) - 2(0, 2)	12256.5835(6)	12256.584(1)	8.0021	0.522	1.912	[76A]
S02 34S	31(7,25) - 32(6,26)	12567.300(100)	12567.309(47)	8.3244	4.831	396.987	[64D]
S02 V2=1	38(4,34) - 39(3,37)	12756.200(100)	12756.266(155)	9.0431	1.099	509.641	[68A]
S02 V2=1	12(2,10) - 13(1,13)	13084.100(100)	13083.930(55)	8.6608	0.793	57.087	[68A]
S02 34S	15(2,14) - 14(3,11)	13184.800(50)	13184.867(34)	8.3449	1.969	82.074	[62B]

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 34S	12(3, 9) - 13(2,12)	13207.900(100)	13207.994(33)	8.2881	1.800	64.256	[62B]
S02 V2=1	1(1, 1) - 2(0, 2)	13457.500(100)	13457.342(9)	7.8842	0.522	1.911	[68A]
S02	50(9,41) - 49(10,40)	13599.500(100)	13599.539(28)	8.2239	7.745	953.813	[62A]
S02 33S	39(7,33) - 38(8,30)	14373.000(200)	14372.916(275)	8.1566	6.000	580.680	[64D]
S02 34S	36(8,28) - 37(7,31)	14547.100(50)	14547.143(42)	8.1341	5.593	530.102	[62B]
S02 34S	41(9,33) - 42(8,34)	14583.050(50)	14583.041(56)	8.1307	6.357	682.469	[62B]
S02	14(2,12) - 15(1,15)	14587.697(20)	14587.742(28)	8.6851	0.621	74.663	[73A]
S02 34S	19(3,17) - 18(4,14)	14754.700(50)	14754.734(35)	8.1432	2.815	135.665	[62B]
S02 34S	26(6,20) - 27(5,23)	14850.400(50)	14850.416(29)	8.1078	4.061	282.945	[62B]
S02 33S	14(2,12) - 15(1,15)	15260.080(100)	15260.116(126)	8.6485	0.592	74.495	[62C]
S02 33S	21(5,17) - 22(4,18)	15279.150(50)	15279.134(84)	8.0677	3.317	189.015	[62A]
S02 V2=1	54(11,43) - 55(10,46)	15309.200(200)	15309.199(135)	8.0605	8.517	1159.049	[68A]
S02	58(12,46) 59(11,49)	15470.400(100)	15470.081(78)	8.0472	9.083	1338.195	[68A]
S02 34S	14(2,12) - 15(1,15)	15994.100(100)	15994.034(82)	8.6080	0.564	74.335	[64D]
S02 V2=1	25(4,22) - 24(5,19)	16048.540(100)	16048.555(49)	8.0177	3.854	235.574	[64B]
S02 V2=1	49(4,46) - 48(5,43)	16069.000(200)	16069.083(304)	8.7296	1.453	807.816	[68A]
S02 V2=1	10(2, 8) - 11(1,11)	16126.890(100)	16126.931(41)	8.2485	0.919	41.943	[64B]
S02 33S	12(3, 9) - 13(2,12)	16636.150(200)	16636.158(110)	7.9840	1.815	64.436	[62A]
S02	32(7,25) - 33(6,28)	16681.030(100)	16680.990(15)	7.9513	5.046	420.794	[64B]
S02 33S	29(5,25) - 28(6,22)	16752.900(200)	16752.589(118)	7.9587	4.454	319.894	[62C]
S02 33S	18(3,15) - 17(4,14)	16759.850(100)	16759.839(85)	7.9590	2.787	124.610	[62A]
S02 34S	37(3,35) - 36(4,32)		17056.070(5382)	8.6339	1.124	459.087	
S02 V2=1	38(8,30) - 39(7,33)	17341.900(300)	17341.733(73)	7.9004	6.015	584.758	[62B]
S02	45(8,38) - 44(9,35)	17539.940(100)	17539.898(25)	7.8919	6.976	771.354	[64B]
S02 34S	5(2, 4) - 6(1, 5)	17970.420(100)	17970.280(29)	7.8034	0.960	15.540	[54A]
S02 V2=1	46(8,38) - 45(9,37)	19229.600(300)	19229.481(94)	7.7742	7.176	802.913	[62B]
S02 33S	34(6,28) - 33(7,27)	19251.300(100)	19251.276(135)	7.7755	5.236	440.665	[62A]
S02	37(8,30) - 38(7,31)	19637.100(100)	19637.064(20)	7.7392	5.815	558.138	[64B]
S02 V2=1	14(2,12) - 15(1,15)	19681.130(100)	19681.110(71)	8.2919	0.632	74.610	[64B]
S02 34S	25(2,24) - 24(3,21)	20260.800(100)	20260.776(162)	8.2860	1.019	209.521	[64D]
S02	12(3, 9) - 13(2,12)	20335.396(20)	20335.398(8)	7.7191	1.829	64.627	[73A]
S02 34S	16(4,12) - 17(3,15)	20548.190(50)	20548.182(33)	7.6912	2.494	112.533	[65A]
S02 33S	5(2, 4) - 6(1, 5)	20605.980(50)	20605.990(51)	7.6269	0.956	15.576	[59A]
S02 34S	8(2, 6) - 9(1, 9)	20699.260(50)	20699.240(43)	7.8354	0.902	29.033	[65A]
S02 V2=1	25(2,24) - 24(3,21)	21264.290(100)	21264.356(80)	8.1618	1.184	210.371	[64B]
S02 V2=1	59(12,48) - 60(11,49)	21479.500(200)	21479.340(230)	7.6201	9.285	1380.537	[68A]
S02 V2=1	8(1, 7) - 7(2, 6)	22065.730(100)	22065.683(34)	7.5057	1.605	24.816	[64A]
S02 V2=1	27(6,22) - 28(5,23)	22220.360(100)	22220.330(42)	7.5790	4.287	303.756	[64B]
S02 33S	8(2, 6) - 9(1, 9)	22320.240(50)	22320.210(88)	7.7294	0.918	29.107	[62A]
S02	24(4,20) - 23(5,19)	22482.548(20)	22482.589(17)	7.5716	3.725	219.286	[73A]
S02 V2=1	17(2,16) - 16(3,13)	22733.990(100)	22733.891(49)	7.6659	2.088	103.042	[64B]
S02 V2=1	22(5,17) - 23(4,20)	22904.860(100)	22904.897(43)	7.5411	3.497	204.648	[64B]
S02 V2=1	30(5,25) - 29(6,24)	22928.520(100)	22928.584(59)	7.5466	4.679	341.054	[64B]
S02	40(7,33) - 39(8,32)	23034.821(20)	23034.787(21)	7.5366	6.209	608.186	[73A]
S02 V2=1	43(9,35) - 44(8,36)	23206.350(300)	23206.323(85)	7.5217	6.784	745.096	[62B]
S02	5(2, 4) - 6(1, 5)	23414.253(20)	23414.254(4)	7.4624	0.952	15.614	[73A]
S02 34S	18(3,15) - 17(4,14)	23732.990(50)	23733.004(42)	7.5057	2.786	124.072	[65A]
S02 33S	31(7,25) - 32(6,26)	23970.050(100)	23970.064(127)	7.4828	4.840	398.218	[62C]
S02	21(5,17) - 22(4,18)	24039.641(20)	24039.629(13)	7.4773	3.322	189.617	[73A]
S02	8(2, 6) - 9(1, 9)	24083.455(20)	24083.474(10)	7.6224	0.935	29.185	[73A]
S02 33S	25(2,24) - 24(3,21)	24132.420(100)	24132.408(215)	8.0313	1.085	209.816	[62C]
S02 33S	26(6,20) - 27(5,23)	24165.690(100)	24165.657(104)	7.4728	4.069	283.830	[62A]
S02	42(9,33) - 43(8,36)	24319.556(20)	24319.660(23)	7.4611	6.580	714.755	[73A]
S02 V2=1	41(7,35) - 40(8,32)	24796.900(300)	24796.977(83)	7.4423	6.402	635.993	[62B]
S02	49(4,46) - 48(5,43)	24915.600(100)	24915.572(87)	8.1675	1.409	807.314	[68A]
S02	35(6,30) - 34(7,27)	25049.430(20)	25049.496(17)	7.4280	5.433	464.345	[73A]

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 34S	15(4,12) - 16(3,13)	25171.040(50)	25171.034(36)	7.4240	2.357	102.117	[65A]
S02	8(1, 7) - 7(2, 6)	25392.776(20)	25392.819(4)	7.3178	1.609	24.671	[51A]
S02 33S	16(4,12) - 17(3,15)	26037.320(100)	26037.349(105)	7.3813	2.502	112.877	[62C]
S02 34S	29(5,25) - 28(6,22)	26038.350(50)	26038.294(43)	7.3850	4.441	318.683	[63C]
S02 V2=1	12(3, 9) - 13(2,12)	26411.750(100)	26411.527(34)	7.3809	1.834	64.744	[64A]
S02 V2=1	57(10,48) - 56(11,45)	26489.400(200)	26489.271(206)	7.3557	8.908	1230.641	[68A]
S02 34S	49(9,41) - 48(10,38)	26505.400(50)	26505.429(81)	7.3590	7.517	915.286	[63C]
S02	25(4,22) - 24(5,19)	26776.574(20)	26776.654(13)	7.3472	3.848	234.726	[73A]
S02 V2=1	5(2, 4) - 6(1, 5)	26850.300(200)	26850.272(26)	7.2882	0.951	15.650	[62A]
S02 34S	39(7,33) - 38(8,30)	27398.000(50)	27398.025(62)	7.3162	5.986	578.620	[63C]
S02 33S	36(8,28) - 37(7,31)	27451.500(200)	27451.639(215)	7.3064	5.604	531.733	[62D]
S02 34S	44(8,36) - 43(9,35)	27657.150(50)	27657.107(67)	7.3036	6.753	737.375	[63C]
S02	25(2,24) - 24(3,21)	27932.200(200)	27932.457(37)	7.8140	1.157	210.144	[68A]
S02 V2=1	4(0, 4) - 3(1, 3)	28138.300(200)	28138.377(19)	6.8967	1.665	5.417	[62A]
S02 V2=1	8(2, 6) - 9(1, 9)	28173.400(200)	28173.509(30)	7.4191	0.941	29.190	[62D]
S02	47(10,38) - 48(9,39)	28179.200(50)	28179.329(27)	7.2694	7.347	890.700	[62B]
S02 33S	8(1, 7) - 7(2, 6)	28272.405(50)	28272.386(67)	7.1753	1.619	24.531	[62D]
S02	17(2,16) - 16(3,13)	28858.037(20)	28858.057(17)	7.3549	2.072	102.750	[73A]
S02 V2=1	21(3,19) - 20(4,16)	29052.630(100)	29052.628(51)	7.2619	3.118	162.411	[64B]
S02	4(0, 4) - 3(1, 3)	29321.3304(4)	29321.330(1)	6.8388	1.667	5.382	[76A]
S02 V2=1	48(10,38) - 49(9,41)	29861.200(200)	29861.126(109)	7.1939	7.551	924.768	[68A]
S02 34S	38(4,34) - 39(3,37)		30028.995(8788)	8.0010	0.918	507.552	
S02 33S	4(0, 4) - 3(1, 3)	30193.994(50)	30194.033(55)	6.7993	1.672	5.346	[62D]
S02	16(2,14) - 17(1,17)	30205.520(100)	30205.522(36)	7.9103	0.474	94.581	[64B]
S02	56(10,46) - 55(11,45)	30218.840(100)	30218.830(48)	7.1812	8.710	1190.779	[65A]
S02 V2=1	37(3,35) - 36(4,32)	30948.200(100)	30948.359(144)	7.7831	1.351	460.544	[68A]
S02 34S	8(1, 7) - 7(2, 6)	30975.450(50)	30975.387(36)	7.0536	1.629	24.398	[65A]
S02 34S	34(6,28) - 33(7,27)	30977.380(50)	30977.359(54)	7.1563	5.225	439.043	[65A]
S02 34S	4(0, 4) - 3(1, 3)	31011.180(50)	31011.148(20)	6.7632	1.677	5.311	[65A]
S02	28(3,25) - 29(2,28)	31089.920(100)	31089.881(49)	7.9287	0.720	279.086	[64B]
S02 33S	17(2,16) - 16(3,13)		31166.598(108)	7.2643	2.026	102.422	
S02 33S	15(4,12) - 16(3,13)	31654.600(100)	31654.798(101)	7.1252	2.359	102.422	[65A]
S02 33S	24(4,20) - 23(5,19)	31798.270(100)	31798.322(106)	7.1212	3.718	218.368	[65A]
S02	16(4,12) - 17(3,15)	31922.210(30)	31922.266(9)	7.1145	2.511	113.244	[63A]
S02 33S	16(2,14) - 17(1,17)	31932.290(100)	31932.288(142)	7.8627	0.448	94.371	[65A]
S02	52(11,41) - 53(10,44)	32195.450(100)	32195.414(37)	7.0960	8.114	1085.913	[64B]
S02 V2=1	32(7,25) - 33(6,28)	32214.620(100)	32214.593(52)	7.0968	5.049	421.959	[64B]
S02 34S	25(6,20) - 26(5,21)	32272.340(50)	32272.387(44)	7.1013	3.867	265.713	[65A]
S02	50(5,45) - 51(4,48)	32829.930(100)	32830.076(154)	7.8834	1.197	871.481	[65A]
S02 34S	17(2,16) - 16(3,13)	33212.810(50)	33212.808(40)	7.1913	1.981	102.117	[65A]
S02 V2=1	52(9,43) - 51(10,42)	33483.300(200)	33483.328(143)	7.0493	8.138	1021.867	[68A]
S02 34S	16(2,14) - 17(1,17)	33672.100(100)	33672.134(133)	7.8170	0.425	94.171	[64D]
S02	26(6,20) - 27(5,23)	34097.720(30)	34097.725(13)	7.0238	4.077	284.803	[63A]
S02	51(9,43) - 50(10,40)	34393.550(100)	34393.501(35)	7.0122	7.940	985.869	[64B]
S02 33S	25(4,22) - 24(5,19)	34425.100(100)	34425.153(121)	7.0221	3.830	233.800	[65A]
S02 V2=1	31(5,27) - 30(6,24)	34530.220(100)	34530.273(60)	7.0125	4.836	360.325	[64B]
S02 34S	35(8,28) - 36(7,29)	34811.010(50)	34810.919(47)	7.0019	5.392	506.379	[65A]
S02 V2=1	21(5,17) - 22(4,18)	34971.600(100)	34971.591(47)	6.9921	3.324	190.131	[64B]
S02 34S	30(7,23) - 31(6,26)	35126.560(50)	35126.522(39)	6.9908	4.627	376.388	[65A]
S02 V2=1	36(6,30) - 35(7,29)	35448.000(100)	35447.865(82)	6.9760	5.636	488.447	[64B]
S02 34S	40(9,31) - 41(8,34)	35664.800(100)	35664.763(73)	6.9700	6.155	655.525	[64D]
S02 V2=1	16(2,14) - 17(1,17)	35855.860(100)	35855.814(91)	7.6827	0.484	94.502	[64C]
S02 34S	45(10,36) - 46(9,37)	35905.600(100)	35905.728(131)	6.9608	6.919	823.858	[64D]
S02	57(12,46) - 58(11,47)	36003.540(100)	36003.305(70)	6.9503	8.881	1300.373	[64B]
S02 V2=1	53(11,43) - 54(10,44)	36003.600(200)	36003.591(138)	6.9507	8.318	1123.785	[68A]
S02	31(7,25) - 32(6,26)	36065.230(30)	36065.268(19)	6.9505	4.848	399.622	[63A]

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_-)$	Measured Frequency	Calculated Frequency		-log(A)	S_{ij}	Energy lower st.	Reference
S02 34S	20(5,15) - 21(4,18)	36294.540(50)	36294.559(	30)	6.9510	3.091	174.047	[65A]
S02	30(5,25) - 29(6,24)	36338.050(30)	36338.144(	22)	6.9426	4.675	339.835	[63A]
S02 V2=1	23(2,22) - 22(3,19)	36791.070(100)	36791.011(	79)	7.3178	1.473	179.434	[64B]
S02 V2=1	19(2,18) - 18(3,15)	36857.000(100)	36856.946(	61)	7.1048	1.987	125.774	[64B]
S02 33S	35(6,30) - 34(7,27)	37008.700(100)	37008.853(	145)	6.9210	5.419	462.467	[68B]
S02 33S	40(7,33) - 39(8,32)	37262.370(100)	37262.373(	207)	6.9113	6.196	605.662	[65A]
S02	21(3,19) - 20(4,16)	37351.800(100)	37351.869(	15)	6.9322	3.107	161.877	[64B]
S02 V2=1	37(8,30) - 38(7,31)	37525.200(100)	37525.181(	62)	6.8985	5.818	559.728	[64B]
S02 33S	28(3,25) - 29(2,28)		38295.735(4588)		7.6888	0.671	278.482	
S02	15(4,12) - 16(3,13)	38518.225(20)	38518.231(	9)	6.8695	2.360	102.750	[73A]
S02 V2=1	28(3,25) - 29(2,28)	38843.500(100)	38843.637(	137)	7.6326	0.738	279.032	[68A]
S02	37(3,35) - 36(4,32)	38909.700(100)	38909.675(	53)	7.4949	1.313	460.196	[64B]
S02 34S	23(2,22) - 22(3,19)	39024.100(100)	39024.152(	93)	7.2941	1.293	178.569	[64D]
S02	46(8,38) - 45(9,37)	39446.990(100)	39446.913(	23)	6.8332	7.171	800.217	[64B]
S02 V2=1	47(8,40) - 46(9,37)	39698.700(200)	39698.621(	115)	6.8268	7.365	832.407	[68A]
S02 34S	6(2, 4) - 7(1, 7)	39819.200(100)	39819.114(	37)	6.9229	0.792	18.710	[64D]
S02 V2=1	16(4,12) - 17(3,15)	40313.080(100)	40313.112(	41)	6.8135	2.514	113.332	[64B]
S02 34S	24(4,20) - 23(5,19)	40652.420(50)	40652.450(	44)	6.8018	3.712	217.518	[65A]
S02	36(8,28) - 37(7,31)	41177.500(100)	41177.431(	20)	6.7782	5.612	533.695	[68A]
S02 33S	23(2,22) - 22(3,19)		41178.623(	231)	7.2002	1.366	178.866	
S02 34S	25(4,22) - 24(5,19)	41540.900(50)	41540.889(	45)	6.7793	3.811	232.947	[64D]
S02 33S	6(2, 4) - 7(1, 7)	41859.550(100)	41859.575(	77)	6.8535	0.800	18.766	[68B]
S02 V2=1	21(2,20) - 20(3,17)	41887.490(100)	41887.405(	73)	7.0327	1.762	151.232	[64B]
S02 33S	25(6,20) - 26(5,21)	41937.350(100)	41937.269(	112)	6.7595	3.873	266.577	[68B]
S02 V2=1	14(2,12) - 13(3,11)	42005.350(100)	42005.417(	57)	6.7258	2.391	73.866	[64B]
S02 V2=1	58(12,46) - 59(11,49)	42111.900(200)	42111.905(	268)	6.7468	9.085	1342.095	[68A]
S02 33S	21(3,19) - 20(4,16)	42384.450(100)	42384.556(	130)	6.7720	3.076	161.285	[64D]
S02 V2=1	50(5,45) - 51(4,48)	42615.900(200)	42615.960(	371)	7.5353	1.232	871.653	[68A]
S02	41(7,35) - 40(8,32)	42680.090(100)	42680.061(	23)	6.7306	6.397	633.858	[64B]
S02	19(2,18) - 18(3,15)	43016.280(100)	43016.325(	23)	6.9050	1.964	125.498	[64B]
S02	23(2,22) - 22(3,19)	43178.140(100)	43178.221(	33)	7.1147	1.445	179.191	[64B]
S02 34S	9(3, 7) - 10(2, 8)	43619.910(100)	43619.980(	41)	6.7219	1.399	42.076	[65A]
S02 33S	20(5,15) - 21(4,18)	43762.400(100)	43762.467(	103)	6.7064	3.097	174.620	[68B]
S02	6(2, 4) - 7(1, 7)	44052.860(20)	44052.873(	6)	6.7827	0.808	18.825	[73A]
S02 33S	19(2,18) - 18(3,15)	44171.620(100)	44171.451(	128)	6.8847	1.900	125.169	[68B]
S02 34S	10(3, 7) - 11(2,10)	44226.240(100)	44226.224(	36)	6.7157	1.505	48.472	[65A]
S02 V2=1	42(9,33) - 43(8,36)	44438.050(100)	44438.079(	88)	6.6788	6.583	716.836	[68A]
S02	41(9,33) - 42(8,34)	44875.860(30)	44875.888(	22)	6.6662	6.378	687.145	[64C]
S02 34S	19(2,18) - 18(3,15)	45079.680(100)	45079.706(	57)	6.8726	1.838	124.864	[65A]
S02 34S	28(3,25) - 29(2,28)		45354.083(1200)		7.4971	0.628	277.928	
S02 33S	30(7,23) - 31(6,26)	46226.250(100)	46226.217(	138)	6.6323	4.635	377.622	[68B]
S02 34S	21(3,19) - 20(4,16)	47002.340(100)	47002.342(	46)	6.6417	3.045	160.735	[64C]
S02 V2=1	15(4,12) - 16(3,13)	47017.600(60)	47017.612(	49)	6.6131	2.361	103.042	[64C]
S02 V2=1	26(6,20) - 27(5,23)	47269.310(60)	47269.293(	44)	6.6015	4.079	285.618	[64C]
S02 34S	21(2,20) - 20(3,17)	47293.110(100)	47293.104(	81)	6.9166	1.586	150.345	[64C]
S02 33S	30(5,25) - 29(6,24)	47449.050(100)	47449.023(	173)	6.5963	4.664	338.480	[68B]
S02	31(5,27) - 30(6,24)	47660.600(50)	47660.704(	17)	6.5891	4.830	359.120	[68A]
S02 V2=1	58(10,48) - 57(11,47)	47745.800(200)	47745.924(	291)	6.5854	9.101	1267.147	[68A]
S02 33S	35(8,28) - 36(7,29)	47746.000(100)	47745.998(	198)	6.5896	5.402	508.008	[68B]
S02 33S	21(2,20) - 20(3,17)	47813.300(100)	47813.418(	166)	6.8830	1.658	150.646	[68B]
S02	14(2,12) - 13(3,11)	47913.420(20)	47913.440(	10)	6.5498	2.395	73.551	[73A]
S02 V2=1	6(2, 4) - 7(1, 7)	47950.790(60)	47950.810(	27)	6.6745	0.811	18.843	[64A]
S02 33S	10(3, 7) - 11(2,10)	48002.250(100)	48002.438(	76)	6.6072	1.511	48.632	[68B]
S02	21(2,20) - 20(3,17)	48120.440(30)	48120.485(	29)	6.8554	1.735	150.973	[64C]
S02 33S	9(3, 7) - 10(2, 8)	48176.420(100)	48176.299(	120)	6.5928	1.398	42.207	[68B]
S02 34S	35(6,30) - 34(7,27)		48233.143(	88)	6.5769	5.404	460.841	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 V2=1	42(7,35) - 41(8,34)	48732.700(200)	48732.485(122)	6.5591	6.595	662.290	[68A]
S02	46(10,36) - 47(9,39)	48958.180(30)	48958.202(27)	6.5529	7.144	859.888	[64C]
S02 V2=1	47(10,38) - 48(9,39)	50523.700(200)	50523.742(114)	6.5120	7.350	893.336	[68A]
S02 34S	40(7,33) - 39(8,32)		50703.754(114)	6.5109	6.180	603.605	
S02	57(10,48) - 56(11,45)	51086.100(100)	51086.329(56)	6.4949	8.904	1226.665	[68A]
S02	36(6,30) - 35(7,29)	51185.220(60)	51185.253(26)	6.4934	5.631	486.808	[64C]
S02 V2=1	37(6,32) - 36(7,29)	51485.100(100)	51485.105(87)	6.4882	5.807	511.560	[68A]
S02 34S	19(5,15) - 20(4,16)		51519.468(38)	6.5007	2.899	160.735	
S02 V2=1	31(7,25) - 32(6,26)	51645.000(100)	51645.205(47)	6.4859	4.850	400.799	[68A]
S02	20(5,15) - 21(4,18)	51736.590(30)	51736.659(11)	6.4877	3.103	175.236	[64C]
S02 34S	2(1, 1) - 2(0, 2)	51822.090(100)	51821.878(27)	5.6725	2.460	1.908	[65A]
S02	10(3, 7) - 11(2,10)	52051.710(30)	52051.767(7)	6.5000	1.517	48.802	[64C]
S02	25(6,20) - 26(5,21)	52188.480(60)	52188.489(16)	6.4742	3.878	267.525	[64C]
S02 33S	2(1, 1) - 2(0, 2)	52647.750(100)	52647.709(80)	5.6517	2.462	1.910	[68B]
S02	51(11,41) - 52(10,42)	52744.000(100)	52744.088(34)	6.4558	7.911	1051.919	[68A]
S02	9(3, 7) - 10(2, 8)	53015.400(200)	53015.252(7)	6.4685	1.397	42.347	[68A]
S02 V2=1	20(3,17) - 19(4,16)		53049.150(68)	6.4428	3.221	149.463	
S02 33S	14(2,12) - 13(3,11)	53387.640(100)	53387.594(128)	6.4072	2.405	73.224	[68B]
S02	2(1, 1) - 2(0, 2)	53528.800(50)	53528.862(3)	5.6299	2.463	1.912	[70A]
S02 V2=1	27(4,24) - 26(5,21)		53634.113(70)	6.4450	4.159	268.349	
S02	40(4,36) - 41(3,39)	54138.800(300)	54139.086(84)	7.2679	0.887	560.038	[68A]
S02	18(2,16) - 19(1,19)	54633.400(200)	54633.556(46)	7.3089	0.359	116.862	[68A]
S02 V2=1	2(1, 1) - 2(0, 2)	54738.800(100)	54738.866(24)	5.6044	2.463	1.911	[68A]
S02 34S	29(7,23) - 30(6,24)		54852.158(72)	6.4152	4.424	356.527	
S02 34S	24(6,18) - 25(5,21)		55664.204(49)	6.3981	3.658	248.934	
S02	52(9,43) - 51(10,42)	55932.000(100)	55932.116(33)	6.3764	8.133	1018.570	[68A]
S02 34S	34(8,26) - 35(7,29)		56006.676(103)	6.3870	5.187	483.273	
S02 34S	39(9,31) - 40(8,32)		56179.108(145)	6.3820	5.951	629.245	
S02 34S	35(3,33) - 34(4,30)		56285.652(3134)	6.9617	1.399	412.230	
S02	56(12,44) - 57(11,47)	56481.050(50)	56481.153(64)	6.3665	8.678	1263.196	[70A]
S02	59(5,55) - 58(6,52)	56572.000(50)	56572.038(130)	7.0855	1.749	1172.622	[70A]
S02 V2=1	52(11,41) - 53(10,44)	56699.500(200)	56699.659(187)	6.3620	8.116	1089.164	[68A]
S02 33S	18(2,16) - 19(1,19)	57417.700(100)	57417.698(201)	7.2704	0.338	116.605	[68B]
S02 33S	31(5,27) - 30(6,24)	57473.550(100)	57473.418(174)	6.3470	4.811	357.751	[68B]
S02 34S	4(1, 3) - 4(0, 4)	57687.500(100)	57687.535(29)	5.5580	4.179	6.346	[65A]
S02 34S	14(4,10) - 15(3,13)		57729.802(39)	6.3612	2.113	91.449	
S02 34S	30(5,25) - 29(6,24)		58010.599(57)	6.3355	4.653	337.260	
S02	30(7,23) - 31(6,26)	58042.410(200)	58042.619(18)	6.3354	4.642	379.014	[65A]
S02 V2=1	10(3, 7) - 11(2,10)	58101.040(100)	58101.195(35)	6.3598	1.519	48.929	[65A]
S02 33S	4(1, 3) - 4(0, 4)	58429.760(100)	58429.877(94)	5.5404	4.189	6.353	[68B]
S02 V2=1	23(3,21) - 22(4,18)	58524.320(100)	58524.350(70)	6.3672	3.271	190.131	[65A]
S02 34S	14(2,12) - 13(3,11)	58552.600(100)	58552.700(51)	6.2849	2.416	72.916	[65A]
S02 V2=1	36(8,28) - 37(7,31)	59013.400(100)	59013.623(66)	6.3125	5.615	535.302	[68A]
S02 V2=1	9(3, 7) - 10(2, 8)	59019.930(100)	59019.994(42)	6.3324	1.396	42.481	[64B]
S02	4(1, 3) - 4(0, 4)	59224.840(100)	59224.868(3)	5.5218	4.198	6.360	[65A]
S02 33S	19(5,15) - 20(4,16)		59442.598(231)	6.3139	2.903	161.285	
S02	47(8,40) - 46(9,37)	59883.500(50)	59883.449(31)	6.2872	7.360	829.730	[70A]
S02 34S	18(2,16) - 19(1,19)		60157.378(232)	7.2343	0.320	116.359	
S02 V2=1	4(1, 3) - 4(0, 4)	60498.730(80)	60498.862(25)	5.4974	4.201	6.356	[63A]
S02 V2=1	18(2,16) - 19(1,19)		60983.893(124)	7.1606	0.367	116.754	
S02	35(8,28) - 36(7,29)	61489.850(50)	61489.831(22)	6.2598	5.408	509.938	[70A]
S02 V2=1	26(4,22) - 25(5,21)	61526.040(100)	61526.056(81)	6.2545	4.118	251.584	[64B]
S02	20(3,17) - 19(4,16)	61636.160(50)	61636.230(17)	6.2433	3.221	148.917	[70A]
S02 V2=1	20(5,15) - 21(4,18)		62524.807(45)	6.2443	3.104	175.764	
S02 33S	14(4,10) - 15(3,13)		63401.316(151)	6.2384	2.117	91.773	
S02 33S	36(6,30) - 35(7,29)		64044.471(398)	6.2028	5.617	484.903	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	27(4,24) - 26(5,21)	64277.100(40)	64277.275(19)	6.2063	4.149	267.525	[63A]
S02 34S	3(2, 2) - 4(1, 3)		64316.391(41)	6.3184	0.407	8.270	
S02 33S	24(6,18) - 25(5,21)		64960.192(262)	6.1963	3.663	249.802	
S02 34S	4(2, 2) - 5(1, 5)		65375.044(42)	6.2970	0.524	10.798	
S02 V2=1	25(6,20) - 26(5,21)	65426.890(100)	65426.855(45)	6.1830	3.880	268.349	[64B]
S02	40(9,31) - 41(8,34)	65714.090(40)	65714.054(23)	6.1729	6.174	660.172	[63A]
S02 V2=1	35(3,33) - 34(4,30)		65811.652(174)	6.6841	1.673	413.677	
S02 33S	29(7,23) - 30(6,24)		66038.313(296)	6.1728	4.431	357.751	
S02 34S	31(5,27) - 30(6,24)		66636.043(108)	6.1561	4.791	356.527	
S02	23(3,21) - 22(4,18)	66724.870(40)	66724.962(21)	6.1950	3.253	189.617	[63A]
S02	42(7,35) - 41(8,34)	66761.150(50)	66761.047(27)	6.1452	6.589	660.172	[70A]
S02 33S	3(2, 2) - 4(1, 3)		66899.962(121)	6.2681	0.406	8.302	
S02	37(6,32) - 36(7,29)	67011.290(40)	67011.326(24)	6.1413	5.801	509.938	[63A]
S02 33S	4(2, 2) - 5(1, 5)		67674.734(123)	6.2502	0.526	10.841	
S02 34S	1(1, 1) - 0(0, 0)		67750.312(37)	5.4925	1.000	0.000	
S02 34S	6(1, 5) - 6(0, 6)	67768.790(100)	67768.761(35)	5.3899	5.484	13.280	[63A]
S02	19(5,15) - 20(4,16)	67848.650(50)	67848.657(13)	6.1413	2.906	161.877	[70A]
S02 33S	6(1, 5) - 6(0, 6)		68346.413(140)	5.3765	5.513	13.296	
S02 33S	1(1, 1) - 0(0, 0)		68634.360(111)	5.4756	1.000	0.000	
S02 33S	34(8,26) - 35(7,29)		68798.164(437)	6.1183	5.196	484.903	
S02	6(1, 5) - 6(0, 6)	68972.170(50)	68972.154(4)	5.3623	5.542	13.313	[70A]
S02	14(4,10) - 15(3,13)	69464.090(50)	69464.094(9)	6.1187	2.121	92.118	[70A]
S02	45(10,36) - 46(9,37)	69480.430(50)	69480.400(26)	6.1000	6.940	829.730	[70A]
S02	1(1, 1) - 0(0, 0)	69575.910(20)	69575.927(3)	5.4578	1.000	0.000	[73A]
S02 33S	20(3,17) - 19(4,16)		69633.658(219)	6.0843	3.223	148.324	
S02	3(2, 2) - 4(1, 3)	69653.570(50)	69653.586(5)	6.2166	0.405	8.336	[70A]
S02	4(2, 2) - 5(1, 5)	70134.368(20)	70134.377(5)	6.2018	0.528	10.886	[73A]
S02 34S	13(4,10) - 14(3,11)		70255.509(43)	6.1148	1.925	82.074	
S02 V2=1	6(1, 5) - 6(0, 6)	70347.950(100)	70348.071(29)	5.3395	5.552	13.304	[63A]
S02 33S	39(9,31) - 40(8,32)		70706.143(975)	6.0816	5.962	631.295	
S02 V2=1	1(1, 1) - 0(0, 0)	70735.920(100)	70736.046(31)	5.4399	1.000	0.000	[63B]
S02 V2=1	32(5,27) - 31(6,26)	70770.640(100)	70770.732(119)	6.0719	5.053	380.206	[64B]
S02 33S	23(3,21) - 22(4,18)		70926.032(137)	6.1225	3.201	189.015	
S02 33S	27(4,24) - 26(5,21)		71514.650(178)	6.0706	4.119	266.577	
S02 V2=1	6(0, 6) - 5(1, 5)	71627.840(80)	71627.848(37)	5.5826	3.005	10.915	[63A]
S02	58(10,48) - 57(11,47)	72383.710(50)	72383.832(66)	6.0389	9.096	1263.196	[70A]
S02	30(3,27) - 31(2,30)	72437.260(40)	72437.211(63)	6.9507	0.579	316.632	[63A]
S02	26(4,22) - 25(5,21)	72668.030(50)	72668.123(24)	6.0339	4.115	250.746	[70A]
S02	6(0, 6) - 5(1, 5)	72758.240(50)	72758.242(2)	5.5578	3.010	10.886	[70A]
S02 V2=1	3(2, 2) - 4(1, 3)		73161.972(34)	6.1566	0.405	8.374	
S02 V2=1	10(1, 9) - 9(2, 8)	73231.580(100)	73231.582(48)	5.8605	2.396	35.615	[64A]
S02	50(11,39) - 51(10,42)	73255.220(50)	73255.177(34)	6.0308	7.706	1018.570	[70A]
S02	35(3,33) - 34(4,30)	73430.420(50)	73430.436(50)	6.5501	1.628	413.312	[70A]
S02 V2=1	30(7,23) - 31(6,26)		73558.201(54)	6.0301	4.644	380.206	
S02 33S	6(0, 6) - 5(1, 5)		73609.839(127)	5.5404	3.026	10.841	
S02 V2=1	4(2, 2) - 5(1, 5)		73883.939(33)	6.1370	0.529	10.915	
S02 34S	6(0, 6) - 5(1, 5)		74404.579(39)	5.5243	3.041	10.798	
S02 34S	23(6,18) - 24(5,19)		74580.810(76)	6.0240	3.452	232.947	
S02 34S	23(3,21) - 22(4,18)		74698.103(80)	6.0621	3.148	188.460	
S02	24(6,18) - 25(5,21)	74866.510(50)	74866.514(16)	6.0110	3.668	250.746	[70A]
S02 V2=1	33(5,29) - 32(6,26)		74868.593(104)	6.0020	5.166	400.799	
S02 34S	18(5,13) - 19(4,16)		76031.277(52)	6.0048	2.682	147.769	
S02 34S	28(7,21) - 29(6,24)		76220.173(122)	5.9927	4.216	337.260	
S02 34S	36(6,30) - 35(7,29)		76252.551(158)	5.9766	5.601	483.273	
S02 34S	33(8,26) - 34(7,27)		76312.870(183)	5.9889	4.981	460.841	
S02	10(1, 9) - 9(2, 8)	76412.162(20)	76412.170(5)	5.7999	2.404	35.478	[73A]

Table 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 33S	13(4,10) - 14(3,11)		76412.834(331)	6.0051	1.926	82.376	
S02	47(4,44) - 46(5,41)	76540.020(50)	76539.861(82)	6.6062	1.692	744.603	[70A]
S02	53(9,45) - 52(10,42)	76762.280(50)	76762.195(44)	5.9621	8.322	1051.919	[70A]
S02	55(12,44) - 56(11,45)	76860.550(50)	76860.507(61)	5.9679	8.473	1226.665	[70A]
S02 34S	38(9,29) - 39(8,32)		76866.718(273)	5.9779	5.744	603.605	
S02 34S	20(3,17) - 19(4,16)		77231.413(49)	5.9490	3.226	147.769	
S02 V2=1	14(4,10) - 15(3,13)		77863.431(44)	5.9733	2.122	92.420	
S02	29(7,23) - 30(6,24)	77926.720(50)	77926.702(21)	5.9569	4.436	359.120	[70A]
S02 34S	27(4,24) - 26(5,21)		78195.127(102)	5.9576	4.087	265.713	
S02 34S	8(3, 5) - 9(2, 8)		78397.033(50)	6.0037	1.127	35.180	
S02 V2=1	19(5,15) - 20(4,16)		78711.366(49)	5.9512	2.907	162.411	
S02 33S	37(6,32) - 36(7,29)		78981.475(842)	5.9289	5.780	508.008	
S02 V2=1	35(8,28) - 36(7,29)		79329.370(78)	5.9312	5.411	511.560	
S02 33S	10(1, 9) - 9(2, 8)		79359.349(161)	5.7468	2.425	35.325	
S02 V2=1	30(3,27) - 31(2,30)		81040.535(238)	6.7983	0.593	316.544	
S02 V2=1	38(6,32) - 37(7,31)		81598.475(185)	5.8851	6.004	535.302	
S02 34S	10(1, 9) - 9(2, 8)		82124.322(51)	5.6984	2.447	35.180	
S02 33S	8(3, 5) - 9(2, 8)		82380.513(215)	5.9384	1.129	35.325	
S02	34(8,26) - 35(7,29)		82409.504(23)	5.8829	5.201	486.808	
S02 V2=1	25(3,23) - 24(4,20)		82488.374(99)	5.9538	3.283	220.527	
S02	48(8,40) - 47(9,39)		82752.775(29)	5.8638	7.549	859.888	
S02 33S	26(4,22) - 25(5,21)		82776.777(337)	5.8652	4.108	249.802	
S02	13(4,10) - 14(3,11)	82951.980(50)	82951.970(10)	5.8980	1.927	82.698	[80A]
S02 34S	8(1, 7) - 8(0, 8)		83043.782(45)	5.1842	6.258	22.662	
S02 33S	8(1, 7) - 8(0, 8)		83345.652(232)	5.1754	6.317	22.694	
S02 33S	18(5,13) - 19(4,16)		83540.275(411)	5.8816	2.685	148.324	
S02	8(1, 7) - 8(0, 8)	83687.984(50)	83688.086(7)	5.1659	6.377	22.727	[80A]
S02 33S	23(6,18) - 24(5,19)		84024.729(532)	5.8682	3.456	233.800	
S02	32(5,27) - 31(6,26)		84320.936(32)	5.8400	5.048	379.014	
S02 V2=1	8(1, 7) - 8(0, 8)		85208.074(36)	5.1448	6.398	22.710	
S02	43(7,37) - 42(8,34)		85246.979(32)	5.8253	6.766	687.145	
S02 34S	33(3,31) - 32(4,28)		85973.415(1738)	6.2890	1.745	368.051	
S02	39(9,31) - 40(8,32)		86153.709(25)	5.8241	5.967	633.858	
S02	8(3, 5) - 9(2, 8)	86639.040(100)	86639.108(7)	5.8720	1.131	35.478	[80A]
S02	20(2,18) - 21(1,21)		86828.882(59)	6.8644	0.276	141.501	
S02 33S	28(7,21) - 29(6,24)		87240.822(649)	5.8162	4.221	338.480	
S02	33(5,29) - 32(6,26)		87926.389(25)	5.7895	5.156	399.622	
S02 V2=1	24(6,18) - 25(5,21)		88028.970(52)	5.8034	3.669	251.584	
S02 34S	7(3, 5) - 8(2, 6)		88720.604(56)	5.8665	0.941	29.724	
S02 V2=1	29(4,26) - 28(5,23)		88888.862(112)	5.7937	4.390	303.756	
S02 33S	33(8,26) - 34(7,27)		89093.954(884)	5.7865	4.988	462.467	
S02 34S	30(3,27) - 31(2,30)		89307.017(2494)	6.7359	0.507	315.316	
S02	44(10,34) - 45(9,37)		90005.068(28)	5.7663	6.733	800.217	
S02 34S	37(6,32) - 36(7,29)		90196.736(264)	5.7574	5.759	506.379	
S02 V2=1	33(3,31) - 32(4,28)		90496.913(192)	6.1544	2.057	369.522	
S02	25(3,23) - 24(4,20)		90548.251(28)	5.8323	3.256	220.036	
S02 33S	20(2,18) - 21(1,21)		90594.529(811)	6.8354	0.260	141.189	
S02 33S	38(9,29) - 39(8,32)		91307.759(1511)	5.7528	5.754	605.662	
S02 V2=1	13(4,10) - 14(3,11)		91400.924(49)	5.7752	1.927	83.005	
S02	18(5,13) - 19(4,16)	91550.405(50)	91550.470(13)	5.7619	2.688	148.917	[78A]
S02 34S	26(4,22) - 25(5,21)	92428.910(50)	92428.904(58)	5.7222	4.101	248.934	[78A]
S02 V2=1	8(3, 5) - 9(2, 8)	92660.315(50)	92660.351(42)	5.7879	1.131	35.615	[78A]
S02 33S	7(3, 5) - 8(2, 6)		93072.017(321)	5.8043	0.941	29.852	
S02	59(10,50) - 58(11,47)		93373.163(79)	5.7056	9.285	1300.373	
S02 V2=1	29(7,23) - 30(6,24)	93456.655(50)	93456.492(68)	5.7235	4.438	360.325	[78A]
S02 V2=1	39(6,34) - 38(7,31)		93474.314(165)	5.7087	6.150	559.728	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 33S	25(3,23) - 24(4,20)		93532.492(506)	5.8007	3.177	219.428	
S02	49(11,39) - 50(10,40)	93641.850(50)	93641.770(34)	5.7141	7.499	985.869	[78A]
S02 34S	17(5,13) - 18(4,14)	93852.100(50)	93852.133(67)	5.7413	2.474	135.665	[78A]
S02 V2=1	20(2,18) - 21(1,21)		94032.741(179)	6.7553	0.282	141.359	
S02	23(6,18) - 24(5,19)	94064.660(50)	94064.719(19)	5.7209	3.459	234.726	[78A]
S02 34S	20(2,18) - 21(1,21)		94250.687(436)	6.8086	0.245	140.893	
S02	52(5,47) - 53(4,50)		94478.719(314)	6.5842	1.043	937.156	
S02 34S	2(2, 0) - 3(1, 3)		95810.425(56)	6.0569	0.161	5.311	
S02 34S	12(4, 8) - 13(3,11)		95922.864(60)	5.7303	1.698	72.916	
S02 34S	25(3,23) - 24(4,20)		96075.191(150)	5.7768	3.098	218.874	
S02 34S	22(6,16) - 23(5,19)		96193.946(113)	5.7013	3.239	217.518	
S02 34S	27(7,21) - 28(6,22)		96204.184(184)	5.6960	4.006	318.683	
S02 33S	32(5,27) - 31(6,26)		96204.979(643)	5.6697	5.034	377.622	
S02 34S	32(8,24) - 33(7,27)		96987.908(291)	5.6821	4.771	439.043	
S02	54(12,42) - 55(11,45)		97177.295(61)	5.6652	8.266	1190.779	
S02 34S	37(9,29) - 38(8,30)		97236.818(428)	5.6763	5.536	578.620	
S02	38(6,32) - 37(7,31)		97466.372(37)	5.6500	5.998	533.695	
S02 33S	33(5,29) - 32(6,26)		97490.686(989)	5.6576	5.127	398.218	
S02	7(3, 5) - 8(2, 6)		97702.359(8)	5.7412	0.940	29.988	
S02	33(3,31) - 32(4,28)		97994.139(48)	6.0581	2.007	369.135	
S02 33S	2(2, 0) - 3(1, 3)		98261.798(198)	6.0235	0.161	5.346	
S02 V2=1	16(2,14) - 15(3,13)		98264.740(68)	5.5780	2.987	92.420	
S02	54(9,45) - 53(10,44)		98917.697(47)	5.6300	8.509	1085.913	
S02	28(7,21) - 29(6,24)		98976.284(22)	5.6515	4.225	339.835	
S02 V2=1	27(3,25) - 26(4,22)		99177.394(134)	5.7660	3.139	253.636	
S02	29(4,26) - 28(5,23)		99392.645(27)	5.6461	4.373	302.957	
S02 V2=1	34(8,26) - 35(7,29)		100215.057(106)	5.6314	5.203	488.447	
S02	59(13,47) - 60(12,48)		100563.104(146)	5.6199	9.034	1414.913	
S02	2(2, 0) - 3(1, 3)	100878.090(50)	100878.113(6)	5.9888	0.161	5.382	[70A]
S02 33S	17(5,13) - 18(4,14)		101559.630(728)	5.6382	2.476	136.205	
S02 33S	12(4, 8) - 13(3,11)		101688.497(500)	5.6539	1.699	73.224	
S02 34S	3(1, 3) - 2(0, 2)		102031.906(54)	5.0225	2.016	1.908	
S02 V2=1	18(5,13) - 19(4,16)		102335.186(53)	5.6202	2.689	149.463	
S02	33(8,26) - 34(7,27)	102690.050(80)	102690.022(26)	5.6012	4.992	464.345	[70A]
S02	49(8,42) - 48(9,39)	102707.240(80)	102707.136(42)	5.5809	7.729	890.700	[70A]
S02 33S	3(1, 3) - 2(0, 2)		103000.264(192)	5.0103	2.015	1.910	
S02 V2=1	7(3, 5) - 8(2, 6)		103699.708(48)	5.6673	0.940	30.130	
S02	3(1, 3) - 2(0, 2)	104029.420(80)	104029.416(5)	4.9974	2.015	1.912	[70A]
S02	16(2,14) - 15(3,13)	104033.560(80)	104033.616(14)	5.4987	2.995	92.118	[70A]
S02 V2=1	31(3,29) - 30(4,26)		104210.661(188)	5.8646	2.469	328.121	
S02	10(1, 9) - 10(0,10)	104239.280(80)	104239.293(10)	4.9501	6.700	34.549	[70A]
S02 33S	10(1, 9) - 10(0,10)		104301.649(391)	4.9555	6.606	34.493	
S02 34S	10(1, 9) - 10(0,10)		104391.649(58)	4.9604	6.516	34.437	
S02 V2=1	2(2, 0) - 3(1, 3)		104518.054(45)	5.9461	0.161	5.417	
S02 34S	31(3,29) - 30(4,26)		104915.004(933)	5.9136	2.143	326.604	
S02 V2=1	3(1, 3) - 2(0, 2)		105117.157(47)	4.9876	2.015	1.911	
S02 33S	22(6,16) - 23(5,19)		105451.635(916)	5.5812	3.242	218.368	
S02 33S	29(4,26) - 28(5,23)		105942.366(888)	5.5679	4.324	301.989	
S02 V2=1	10(1, 9) - 10(0,10)		105956.738(45)	4.9304	6.733	34.523	
S02 V2=1	39(9,31) - 40(8,32)		106223.402(185)	5.5546	5.969	635.993	
S02 34S	33(5,29) - 32(6,26)		106374.179(270)	5.5465	5.096	396.987	
S02	38(9,29) - 39(8,32)	106674.820(80)	106674.752(27)	5.5500	5.758	608.186	[70A]
S02 V2=1	29(3,27) - 28(4,24)		106870.639(166)	5.7407	2.852	289.493	
S02	27(3,25) - 26(4,22)	107060.190(80)	107060.323(35)	5.6680	3.102	253.170	[70A]
S02 33S	27(7,21) - 28(6,22)		107244.607(1159)	5.5540	4.010	319.894	
S02 V2=1	23(6,18) - 24(5,19)		107251.253(62)	5.5534	3.460	235.574	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 34S	32(5,27) - 31(6,26)		107567.672(176)	5.5255	5.020	376.388	
S02	12(4, 8) - 13(3,11)	107843.460(80)	107843.508(11)	5.5770	1.701	73.551	[70A]
S02 33S	27(3,25) - 26(4,22)		108381.510(1689)	5.6674	2.993	252.563	
S02 33S	31(3,29) - 30(4,26)		108507.425(7000)	5.8436	2.276	327.112	
S02	42(4,38) - 43(3,41)	108915.460(80)	108915.346(138)	6.4479	0.755	612.834	[70A]
S02	39(6,34) - 38(7,31)	108955.910(80)	108955.990(35)	5.5058	6.141	558.138	[70A]
S02 34S	27(3,25) - 26(4,22)		109260.392(274)	5.6726	2.886	252.018	
S02 33S	32(8,24) - 33(7,27)		109680.503(1541)	5.5213	4.777	440.665	
S02	17(5,13) - 18(4,14)	109757.600(80)	109757.633(15)	5.5368	2.477	136.782	[70A]
S02 33S	16(2,14) - 15(3,13)		109827.913(422)	5.4249	3.018	91.773	
S02 V2=1	22(3,19) - 21(4,18)		110003.786(89)	5.4749	3.682	175.764	
S02	43(10,34) - 44(9,35)	110363.800(80)	110363.759(29)	5.5045	6.525	771.354	[70A]
S02 33S	38(6,32) - 37(7,31)		*110995.847(1557)*	*5.4823*	*5.979*	*531.733*	
S02 33S	37(9,29) - 38(8,30)		111636.668(2337)	5.4957	5.544	580.680	
S02	31(3,29) - 30(4,26)	111755.030(80)	111755.106(46)	5.7791	2.418	327.708	[70A]
S02	44(7,37) - 43(8,36)	111875.540(80)	111875.440(40)	5.4691	6.954	714.755	[70A]
S02 34S	29(4,26) - 28(5,23)		111902.713(229)	5.5018	4.273	301.119	
S02 34S	11(4, 8) - 12(3, 9)		112532.381(71)	5.5432	1.488	64.696	
S02 34S	29(3,27) - 28(4,24)		112577.881(500)	5.7184	2.547	287.922	
S02 33S	29(3,27) - 28(4,24)		113779.275(3890)	5.6835	2.674	288.451	
S02	48(11,37) - 49(10,40)	113970.870(80)	113970.841(38)	5.4615	7.291	953.813	[70A]
S02 V2=1	35(5,31) - 34(6,28)		114050.794(180)	5.4558	5.445	443.895	
S02 V2=1	28(7,21) - 29(6,24)		114467.206(90)	5.4655	4.227	341.054	
S02	29(3,27) - 28(4,24)	114565.350(80)	114565.476(41)	5.6538	2.806	289.053	[70A]
S02 34S	6(3, 3) - 7(2, 6)		114574.468(71)	5.5933	0.710	24.398	
S02	60(10,50) - 59(11,49)	115090.630(80)	115090.932(102)	5.4316	9.471	1338.195	[70A]
S02 34S	16(2,14) - 15(3,13)		115291.389(60)	5.3582	3.041	91.449	
S02	22(6,16) - 23(5,19)	115317.580(80)	115317.585(20)	5.4644	3.245	219.286	[70A]
S02 34S	21(6,16) - 22(5,17)		115722.278(152)	5.4703	3.026	202.801	
S02 34S	16(5,11) - 17(4,14)		115744.759(95)	5.4827	2.256	124.072	
S02	57(5,53) - 56(6,50)		115904.904(174)	6.0632	2.062	1096.786	
S02 V2=1	8(0, 8) - 7(1, 7)		115933.912(54)	4.8878	4.590	18.843	
S02 V2=1	28(4,24) - 27(5,23)		116163.380(141)	5.4189	4.505	285.618	
S02 V2=1	12(4, 8) - 13(3,11)		116235.826(52)	5.4829	1.701	73.866	
S02 34S	26(7,19) - 27(6,22)		116859.899(260)	5.4502	3.793	300.729	
S02	8(0, 8) - 7(1, 7)	116980.440(80)	116980.450(5)	4.8713	4.601	18.825	[70A]
S02 34S	31(8,24) - 32(7,25)		117202.021(410)	5.4416	4.560	417.904	
S02	53(12,42) - 54(11,43)	117412.570(80)	117412.713(65)	5.4219	8.058	1155.537	[70A]
S02 34S	36(9,27) - 37(8,30)		117632.232(615)	5.4333	5.325	554.279	
S02 33S	8(0, 8) - 7(1, 7)		117758.558(272)	4.8598	4.632	18.766	
S02 34S	8(0, 8) - 7(1, 7)		118478.550(56)	4.8491	4.662	18.710	
S02 33S	11(4, 8) - 12(3, 9)		118505.952(761)	5.4758	1.489	64.991	
S02	22(3,19) - 21(4,18)	118577.420(80)	118577.505(25)	5.3728	3.685	175.236	[70A]
S02 33S	6(3, 3) - 7(2, 6)		118677.556(454)	5.5473	0.711	24.531	
S02	27(7,21) - 28(6,22)	118994.210(80)	118994.233(26)	5.4183	4.014	321.230	[70A]
S02	32(3,29) - 33(2,32)	119483.080(80)	119482.926(88)	6.4090	0.479	356.530	[70A]
S02	55(9,47) - 54(10,44)		119621.838(62)	5.3811	8.691	1120.557	
S02	45(4,42) - 44(5,39)	120023.400(80)	120023.410(86)	5.9162	2.058	684.519	[70A]
S02 V2=1	33(8,26) - 34(7,27)		120488.074(152)	5.3964	4.994	465.998	
S02 V2=1	31(4,28) - 30(5,25)		120564.282(172)	5.4126	4.517	341.819	
S02 V2=1	17(5,13) - 18(4,14)		120569.507(59)	5.4179	2.478	137.335	
S02	58(13,45) - 59(12,48)		120713.251(144)	5.3848	8.826	1376.490	
S02 33S	*39(6,34) - 38(7,31)*		*120838.376(3228)*	*5.3731*	*6.112*	*556.151*	
S02 V2=1	34(5,29) - 33(6,28)		122226.491(236)	5.3561	5.411	421.959	
S02	6(3, 3) - 7(2, 6)	123057.690(80)	123057.714(9)	5.4999	0.711	24.671	[70A]
S02	32(8,24) - 33(7,27)	123194.700(80)	123194.644(29)	5.3697	4.781	442.520	[70A]

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 33S	16(5,11) - 17(4,14)		123259.998(1075)	5.4005	2.257	124.610	
S02 34S	38(6,32) - 37(7,31)		123913.338(484)	5.3402	5.959	530.102	
S02 34S	12(2,10) - 12(1,11)		124496.497(65)	4.6216	9.975	52.970	
S02 34S	10(2, 8) - 10(1, 9)		124614.117(59)	4.6464	7.892	37.920	
S02	11(4, 8) - 12(3, 9)	124864.740(80)	124864.805(13)	5.4076	1.489	65.306	[70A]
S02 33S	21(6,16) - 22(5,17)		125031.388(1449)	5.3692	3.029	203.640	
S02	22(2,20) - 23(1,23)	125427.130(80)	125427.147(78)	6.5274	0.218	168.492	[70A]
S02 V2=1	12(1,11) - 11(2,10)		126111.666(62)	5.0805	3.365	48.929	
S02 33S	12(2,10) - 12(1,11)		126461.424(1120)	4.6027	9.941	53.038	
S02 V2=1	38(9,29) - 39(8,32)		126720.599(259)	5.3291	5.760	610.339	
S02	37(9,29) - 38(8,30)	126962.460(80)	126962.421(31)	5.3280	5.548	583.167	[70A]
S02 33S	10(2, 8) - 10(1, 9)		126973.644(813)	4.6246	7.843	37.972	
S02	35(5,31) - 34(6,28)	126980.700(80)	126980.849(37)	5.3133	5.431	442.748	[70A]
S02	50(8,42) - 49(9,41)	127081.960(80)	127081.753(46)	5.3020	7.912	922.154	[70A]
S02 33S	22(3,19) - 21(4,18)		127288.120(872)	5.2793	3.696	174.620	
S02	28(4,24) - 27(5,23)	127428.230(80)	127428.307(35)	5.2946	4.503	284.803	[70A]
S02 33S	26(7,19) - 27(6,22)		127809.090(1849)	5.3332	3.797	301.933	
S02	45(7,39) - 44(8,36)	128103.810(80)	128103.807(47)	5.2924	7.114	743.034	[70A]
S02 V2=1	22(6,16) - 23(5,19)		128461.085(78)	5.3273	3.246	220.145	
S02	12(2,10) - 12(1,11)	128605.130(80)	128605.091(18)	4.5825	9.902	53.108	[70A]
S02 34S	8(2, 6) - 8(1, 7)		128668.824(59)	4.6487	5.772	25.432	
S02 V2=1	6(3, 3) - 7(2, 6)		129050.553(55)	5.4415	0.711	24.816	
S02	12(1,11) - 11(2,10)	129105.830(80)	129105.799(9)	5.0444	3.379	48.802	[70A]
S02 V2=1	32(3,29) - 33(2,32)		129157.360(389)	6.3018	0.490	356.404	
S02	10(2, 8) - 10(1, 9)	129514.810(80)	129514.785(14)	4.6017	7.791	38.027	[70A]
S02 34S	14(2,12) - 14(1,13)	129803.360(200)	129803.404(74)	4.5628	11.691	70.539	[64C]
S02 33S	31(8,24) - 32(7,25)		129869.334(2433)	5.3073	4.565	419.521	
S02 33S	22(2,20) - 23(1,23)		130012.184(2563)	6.5060	0.206	168.120	
S02 V2=1	40(6,34) - 39(7,33)		130340.912(371)	5.2722	6.353	584.758	
S02 34S	5(3, 3) - 6(2, 4)		130584.350(82)	5.4983	0.505	20.038	
S02	42(10,32) - 43(9,35)	130680.010(80)	130679.878(33)	5.2885	6.315	743.136	[70A]
S02	31(4,28) - 30(5,25)	130859.400(80)	130859.586(37)	5.3046	4.492	341.047	[70A]
S02	12(1,11) - 12(0,12)	131014.860(80)	131014.837(15)	4.7316	6.645	48.738	[70A]
S02 33S	14(2,12) - 14(1,13)		131189.176(1674)	4.5484	11.706	70.629	
S02 33S	8(2, 6) - 8(1, 7)		131246.848(593)	4.6259	5.733	25.474	
S02	16(5,11) - 17(4,14)	131274.930(80)	131274.914(17)	5.3182	2.259	125.184	[70A]
S02 V2=1	12(2,10) - 12(1,11)	131530.510(100)	131530.479(45)	4.5575	9.888	53.136	[64C]
S02 33S	12(1,11) - 12(0,12)		131561.197(661)	4.7340	6.527	48.649	
S02 34S	39(6,34) - 38(7,31)		131936.191(617)	5.2607	6.082	554.527	
S02 33S	36(9,27) - 37(8,30)		131970.438(3455)	5.2829	5.333	556.340	
S02 33S	12(1,11) - 11(2,10)		132084.564(417)	5.0096	3.419	48.632	
S02 34S	12(1,11) - 12(0,12)	132114.040(200)	132113.982(74)	4.7361	6.414	48.564	[64C]
S02 V2=1	10(2, 8) - 10(1, 9)	132594.390(100)	132594.576(48)	4.5758	7.773	38.058	[64A]
S02	14(2,12) - 14(1,13)	132744.860(80)	132744.809(22)	4.5327	11.715	70.722	[70A]
S02 V2=1	12(1,11) - 12(0,12)	133003.550(100)	133003.582(56)	4.7129	6.687	48.700	[64C]
S02 V2=1	11(4, 8) - 12(3, 9)	133271.680(100)	133271.713(59)	5.3263	1.489	65.625	[64C]
S02 34S	5(1, 5) - 4(0, 4)	133471.470(200)	133471.469(68)	4.6764	3.140	6.346	[64C]
S02 V2=1	22(2,20) - 23(1,23)		133645.514(269)	6.4397	0.223	168.312	
S02	8(2, 6) - 8(1, 7)	134004.860(80)	134004.805(11)	4.6019	5.692	25.518	[70A]
S02	47(11,37) - 48(10,38)	134203.820(80)	134203.807(43)	5.2523	7.081	922.404	[70A]
S02 34S	22(2,20) - 23(1,23)		134417.297(863)	6.4863	0.195	167.768	
S02 V2=1	27(7,21) - 28(6,22)	134482.980(100)	134483.084(122)	5.2624	4.015	322.461	[64C]
S02 34S	10(4, 6) - 11(3, 9)		134535.324(92)	5.3410	1.267	56.942	
S02 33S	5(1, 5) - 4(0, 4)		134550.980(331)	4.6664	3.136	6.353	
S02 34S	15(5,11) - 16(4,12)		134703.395(119)	5.3015	2.040	113.219	
S02 34S	6(2, 4) - 6(1, 5)	134826.120(200)	134826.285(63)	4.6443	3.876	15.540	[64C]

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 33S	5(3, 3) - 6(2, 4)		134830.330(576)	5.4568	0.505	20.162	
S02 34S	12(1,11) - 11(2,10)	134873.840(200)	134873.779(65)	4.9774	3.459	48.472	[64C]
S02	21(6,16) - 22(5,17)	134943.300(80)	134943.336(23)	5.2696	3.030	204.543	[70A]
S02 V2=1	14(2,12) - 14(1,13)	135531.580(100)	135531.590(45)	4.5092	11.717	70.746	[64C]
S02 34S	22(3,19) - 21(4,18)	135566.280(200)	135566.340(64)	5.1957	3.709	174.047	[65A]
S02	5(1, 5) - 4(0, 4)	135696.020(80)	135696.012(8)	4.6559	3.132	6.360	[70A]
S02	34(5,29) - 33(6,28)	135963.000(80)	135963.113(46)	5.2139	5.405	420.794	[70A]
S02 33S	35(5,31) - 34(6,28)		136070.293(3421)	5.2269	5.386	441.308	
S02 33S	31(4,28) - 30(5,25)		136342.094(2964)	5.2587	4.414	340.063	
S02 34S	20(6,14) - 21(5,17)		136343.836(202)	5.2682	2.810	188.693	
S02 V2=1	5(1, 5) - 4(0, 4)	136675.340(100)	136675.326(61)	4.6505	3.131	6.356	[64C]
S02 34S	25(7,19) - 26(6,20)		136848.215(341)	5.2531	3.579	283.441	
S02 V2=1	8(2, 6) - 8(1, 7)	137234.310(100)	137234.287(53)	4.5756	5.678	25.552	[64A]
S02 33S	6(2, 4) - 6(1, 5)		137478.074(389)	4.6213	3.855	15.576	
S02 34S	30(8,22) - 31(7,25)		137521.031(547)	5.2401	4.346	397.406	
S02	52(12,40) - 53(11,43)	137585.050(80)	137585.133(73)	5.2186	7.849	1120.940	[70A]
S02 34S	35(9,27) - 36(8,28)		137836.396(822)	5.2325	5.113	530.587	
S02 34S	32(3,29) - 33(2,32)		138205.479(4616)	6.2731	0.423	355.043	
S02 33S	28(4,24) - 27(5,23)		138553.619(1295)	5.1862	4.498	283.830	
S02	5(3, 3) - 6(2, 4)	139355.060(80)	139355.061(11)	5.4140	0.505	20.294	[70A]
S02	26(7,19) - 27(6,22)	139474.540(80)	139474.504(28)	5.2192	3.799	303.254	[70A]
S02	6(2, 4) - 6(1, 5)	140306.170(80)	140306.164(9)	4.5973	3.833	15.614	[70A]
S02 33S	10(4, 6) - 11(3, 9)		140348.027(1016)	5.2858	1.267	57.236	
S02	57(13,45) - 58(12,46)		140800.725(147)	5.1873	8.617	1338.711	
S02 V2=1	32(8,24) - 33(7,27)		140967.971(206)	5.1976	4.782	444.188	
S02 34S	4(2, 2) - 4(1, 3)	141158.760(200)	141158.977(72)	4.6538	2.288	8.270	[64C]
S02 34S	31(4,28) - 30(5,25)		141195.699(461)	5.2209	4.335	339.195	
S02 34S	16(2,14) - 16(1,15)	141653.160(200)	141653.424(82)	4.4659	12.795	90.569	[64C]
S02 V2=1	16(5,11) - 17(4,14)	142044.090(100)	142044.320(69)	5.2190	2.259	125.745	[64C]
S02 33S	16(2,14) - 16(1,15)		142278.193(2649)	4.4571	12.886	90.691	
S02 33S	15(5,11) - 16(4,12)		142294.311(1541)	5.2300	2.041	113.746	
S02	56(9,47) - 55(10,46)	142690.180(80)	142689.994(80)	5.1501	8.873	1155.845	[70A]
S02	16(2,14) - 16(1,15)	143057.110(80)	143057.059(28)	4.4471	12.972	90.817	[70A]
S02	31(8,24) - 32(7,25)	143357.800(80)	143357.770(33)	5.1784	4.568	421.351	[70A]
S02 V2=1	6(2, 4) - 6(1, 5)		143663.779(59)	4.5710	3.825	15.650	
S02 33S	4(2, 2) - 4(1, 3)		143795.838(239)	4.6311	2.280	8.302	
S02 34S	35(5,31) - 34(6,28)		144436.498(572)	5.1529	5.339	440.076	
S02 V2=1	5(3, 3) - 6(2, 4)		145331.285(62)	5.3630	0.505	20.442	
S02 33S	20(6,14) - 21(5,17)		145562.121(2087)	5.1827	2.812	189.525	
S02 V2=1	16(2,14) - 16(1,15)		145740.037(51)	4.4256	13.000	90.837	
S02	51(8,44) - 50(9,41)	145970.290(80)	145970.119(61)	5.1208	8.081	954.267	[70A]
S02 34S	2(2, 0) - 2(1, 1)		146020.453(80)	4.7728	0.873	3.637	
S02	40(6,34) - 39(7,33)	146393.720(80)	146393.703(55)	5.1176	6.345	583.184	[70A]
S02	10(4, 6) - 11(3, 9)	146550.080(80)	146550.098(14)	5.2294	1.268	57.549	[70A]
S02	4(2, 2) - 4(1, 3)	146605.520(80)	146605.521(8)	4.6074	2.272	8.336	[70A]
S02 V2=1	37(9,29) - 38(8,30)		146992.758(351)	5.1406	5.549	585.337	
S02 V2=1	33(4,30) - 32(5,27)		147129.934(244)	5.1803	4.512	382.567	
S02	36(9,27) - 37(8,30)	147239.280(80)	147239.184(35)	5.1401	5.335	558.793	[70A]
S02 33S	25(7,19) - 26(6,20)		147790.381(2739)	5.1525	3.582	284.636	
S02 V2=1	21(6,16) - 22(5,17)		148089.244(97)	5.1520	3.031	205.412	
S02 33S	2(2, 0) 2(1, 1)		148614.354(234)	4.7504	0.872	3.666	
S02 33S	34(5,29) - 33(6,28)		148925.395(2023)	5.0967	5.388	419.361	
S02 34S	28(4,24) - 27(5,23)		149209.852(152)	5.0899	4.496	282.945	
S02 V2=1	4(2, 2) - 4(1, 3)		150060.402(63)	4.5812	2.270	8.374	
S02 33S	30(8,22) - 31(7,25)		150131.270(3581)	5.1233	4.351	399.017	
S02	15(5,11) - 16(4,12)	150381.100(80)	150381.139(20)	5.1579	2.042	114.309	[70A]

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	41(6,36) - 40(7,33)	150486.920(80)	150487.027(51)	5.0855	6.445	608.954	[70A]
S02	41(10,32) - 42(9,33)	150878.810(80)	150878.693(39)	5.1057	6.103	715.566	[70A]
S02 V2=1	37(5,33) - 36(6,30)		151196.889(283)	5.0958	5.656	489.629	
S02	2(2, 0) - 2(1, 1)	151378.630(80)	151378.668(8)	4.7270	0.871	3.697	[70A]
S02 34S	4(3, 1) - 5(2, 4)		151917.605(97)	5.4361	0.303	16.140	
S02 33S	35(9,27) - 36(8,28)		152135.207(4907)	5.1033	5.119	532.649	
S02 34S	9(4, 6) - 10(3, 7)		152953.730(109)	5.2110	1.052	49.947	
S02 34S	3(2, 2) - 3(1, 3)		153015.074(80)	4.6402	1.441	5.311	
S02	43(4,40) - 42(5,37)	153677.140(80)	153677.154(84)	5.4893	2.504	627.131	[70A]
S02	46(11,35) - 47(10,38)	154373.340(80)	154373.303(51)	5.0738	6.870	891.640	[70A]
S02 V2=1	2(2, 0) - 2(1, 1)		154896.346(67)	4.7010	0.870	3.737	
S02 V2=1	10(4, 6) - 11(3, 9)		154925.377(67)	5.1606	1.268	57.875	
S02 V2=1	26(7,19) - 27(6,22)		154937.348(159)	5.0857	3.800	304.498	
S02 34S	14(5, 9) - 15(4,12)		155233.016(151)	5.1371	1.821	102.956	
S02	20(6,14) - 21(5,17)	155389.620(80)	155389.678(26)	5.0974	2.813	190.419	[70A]
S02 33S	3(2, 2) - 3(1, 3)		155523.871(225)	4.6189	1.442	5.346	
S02 34S	19(6,14) - 20(5,15)		156033.668(251)	5.1056	2.593	175.258	
S02 33S	4(3, 1) - 5(2, 4)		156090.881(702)	5.4009	0.303	16.263	
S02 34S	24(7,17) - 25(6,20)		157059.027(431)	5.0833	3.363	266.789	
S02	33(4,30) - 32(5,27)		157135.428(47)	5.0946	4.474	381.827	
S02 V2=1	18(2,16) - 17(3,15)		157362.746(81)	4.9190	3.704	113.532	
S02 34S	29(8,22) - 30(7,23)		157588.678(693)	5.0702	4.131	377.560	
S02	51(12,40) - 52(11,41)		157687.469(83)	5.0444	7.638	1086.987	
S02	54(5,49) - 55(4,52)		157769.943(582)	5.9818	0.931	1005.164	
S02 34S	34(9,25) - 35(8,28)		158002.533(1051)	5.0607	4.899	507.540	
S02 34S	39(10,30) - 40(9,31)		158173.225(1510)	5.0549	5.666	656.715	
S02	3(2, 2) - 3(1, 3)	158199.740(80)	158199.783(8)	4.5965	1.442	5.382	[70A]
S02 33S	9(4, 6) - 10(3, 7)		158844.514(1321)	5.1618	1.052	50.233	
S02	46(7,39) - 45(8,38)	158845.080(80)	158844.924(62)	5.0104	7.300	771.939	[70A]
S02	25(7,19) - 26(6,20)	159447.960(80)	159447.945(32)	5.0535	3.584	285.940	[70A]
S02 V2=1	10(0,10) - 9(1, 9)		159887.246(67)	4.4155	6.413	29.190	
S02 34S	5(2, 4) - 5(1, 5)		160143.619(76)	4.5468	2.450	10.798	
S02	18(2,16) - 18(1,17)	160342.990(80)	160342.957(33)	4.3287	13.566	113.336	[70A]
S02 33S	18(2,16) - 18(1,17)		160508.709(4223)	4.3330	13.393	113.166	
S02	4(3, 1) - 5(2, 4)	160543.060(80)	160543.057(12)	5.3644	0.303	16.395	[70A]
S02 34S	18(2,16) - 18(1,17)		160802.615(91)	4.3363	13.219	113.002	
S02	10(0,10) - 9(1, 9)	160827.880(80)	160827.844(9)	4.4030	6.430	29.185	[70A]
S02	56(13,43) - 57(12,46)		160831.633(155)	5.0172	8.406	1301.574	
S02 33S	40(6,34) - 39(7,33)		160884.975(4120)	4.9964	6.321	581.159	
S02 33S	33(4,30) - 32(5,27)		161064.182(7304)	5.0736	4.361	380.831	
S02 V2=1	31(8,24) - 32(7,25)		161118.482(272)	5.0298	4.569	423.033	
S02 V2=1	15(5,11) - 16(4,12)		161153.734(81)	5.0713	2.042	114.877	
S02 34S	34(5,29) - 33(6,28)		161392.291(482)	4.9932	5.373	418.117	
S02 33S	10(0,10) - 9(1, 9)		161452.654(540)	4.3948	6.476	29.107	
S02 V2=1	3(2, 2) - 3(1, 3)		161799.213(69)	4.5708	1.442	5.417	
S02 34S	10(0,10) - 9(1, 9)		162020.389(71)	4.3873	6.521	29.033	
S02 33S	5(2, 4) - 5(1, 5)		162562.242(276)	4.5267	2.453	10.841	
S02 33S	14(5, 9) - 15(4,12)		162743.551(2039)	5.0754	1.822	103.478	
S02 34S	7(1, 7) - 6(0, 6)		162775.932(80)	4.4006	4.455	13.280	
S02	57(9,49) - 56(10,46)		162973.201(95)	4.9761	9.046	1191.787	
S02 V2=1	18(2,16) - 18(1,17)		162976.660(62)	4.3093	13.626	113.352	
S02	18(2,16) - 17(3,15)		163119.438(21)	4.8683	3.719	113.244	
S02	30(8,22) - 31(7,25)		163567.619(37)	5.0135	4.353	400.825	
S02	14(1,13) - 14(0,14)		163605.531(20)	4.5221	6.412	65.264	
S02	37(5,33) - 36(6,30)		163924.904(51)	4.9884	5.634	488.515	
S02 33S	7(1, 7) - 6(0, 6)		163964.910(546)	4.3923	4.442	13.296	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
SO2 34S	33(4,30) - 32(5,27)		164323.381(864)	5.0590	4.246	379.976	
SO2 33S	14(1,13) - 14(0,14)		164624.941(1118)	4.5227	6.286	65.137	
SO2	9(4, 6) - 10(3, 7)		165123.695(17)	5.1114	1.052	50.538	
SO2	5(2, 4) - 5(1, 5)		165144.650(9)	4.5056	2.456	10.886	
SO2	7(1, 7) - 6(0, 6)		165225.443(11)	4.3836	4.430	13.313	
SO2 33S	19(6,14) - 20(5,15)		165263.340(2875)	5.0306	2.594	176.080	
SO2 34S	14(1,13) - 14(0,14)		165620.654(100)	4.5231	6.167	65.014	
SO2 V2=1	14(1,13) - 14(0,14)		165963.764(68)	4.5042	6.457	65.210	
SO2 V2=1	7(1, 7) - 6(0, 6)		166061.041(72)	4.3811	4.425	13.304	
SO2	44(4,40) - 45(3,43)		166386.871(243)	5.9734	0.661	667.972	
SO2 V2=1	4(3, 1) - 5(2, 4)		166507.898(71)	5.3206	0.303	16.546	
SO2 V2=1	35(4,32) - 34(5,29)		166835.070(320)	5.0574	4.352	426.036	
SO2 V2=1	36(9,27) - 37(8,30)		167249.008(454)	4.9776	5.337	560.979	
SO2	35(9,27) - 36(8,28)		167367.232(40)	4.9789	5.122	535.068	
SO2	55(5,51) - 54(6,48)		167656.025(221)	5.4887	2.466	1023.549	
SO2 33S	24(7,17) - 25(6,20)		167949.898(3815)	4.9957	3.365	267.976	
SO2 V2=1	20(6,14) - 21(5,17)		168508.811(120)	4.9954	2.813	191.298	
SO2	24(2,22) - 25(1,25)		168789.877(106)	6.2635	0.179	197.833	
SO2 V2=1	5(2, 4) - 5(1, 5)		168826.191(69)	4.4803	2.458	10.915	
SO2 33S	18(2,16) - 17(3,15)		169162.465(1205)	4.8160	3.762	112.877	
SO2 33S	29(8,22) - 30(7,23)		170171.457(5012)	4.9697	4.135	379.164	
SO2 34S	3(3, 1) - 4(2, 2)		170284.869(109)	5.5562	0.127	12.979	
SO2	34(3,31) - 35(2,34)		170293.520(132)	6.0424	0.408	398.776	
SO2 34S	7(2, 6) - 7(1, 7)		170546.945(75)	4.4720	3.286	18.710	
SO2	14(5, 9) - 15(4,12)		170754.621(22)	5.0127	1.822	104.035	
SO2	40(10,30) - 41(9,33)		171017.926(45)	4.9473	5.890	688.642	
SO2	47(7,41) - 46(8,38)		171036.662(66)	4.9153	7.435	801.533	
SO2 V2=1	24(3,21) - 23(4,20)		171566.920(129)	4.8748	4.207	204.648	
SO2 33S	37(5,33) - 36(6,30)		172211.904(8712)	4.9296	5.565	487.039	
SO2 33S	34(9,25) - 35(8,28)		172255.355(6717)	4.9477	4.905	509.600	
SO2	52(8,44) - 51(9,43)		172728.283(82)	4.9003	8.259	987.016	
SO2 33S	7(2, 6) - 7(1, 7)		172831.824(476)	4.4535	3.295	18.766	
SO2 34S	8(4, 4) - 9(3, 7)		173207.393(130)	5.0996	0.838	43.531	
SO2 V2=1	9(4, 6) - 10(3, 7)		173495.895(76)	5.0506	1.052	50.867	
SO2 33S	24(2,22) - 25(1,25)		173943.217(6318)	6.2480	0.170	197.395	
SO2 33S	39(10,30) - 40(9,31)		174096.416(9436)	4.9293	5.674	659.243	
SO2	45(11,35) - 46(10,36)		174463.822(61)	4.9186	6.658	861.522	
SO2 33S	3(3, 1) - 4(2, 2)		174505.555(807)	5.5245	0.127	13.098	
SO2 34S	13(5, 9) - 14(4,10)		174576.623(181)	5.0083	1.604	93.374	
SO2 34S	40(6,34) - 39(7,33)		174817.457(1130)	4.8898	6.297	579.534	
SO2 34S	18(2,16) - 17(3,15)		174850.270(73)	4.7678	3.807	112.533	
SO2 V2=1	25(7,19) - 26(6,20)		174901.006(202)	4.9365	3.584	287.195	
SO2	19(6,14) - 20(5,15)		175101.383(30)	4.9551	2.595	176.962	
SO2	7(2, 6) - 7(1, 7)		175275.717(10)	4.4340	3.304	18.825	
SO2 V2=1	30(4,26) - 29(5,25)		176012.836(243)	4.8696	4.909	322.249	
SO2 34S	18(6,12) - 19(5,15)		176093.621(307)	4.9634	2.375	162.454	
SO2	41(4,38) - 40(5,35)		176295.963(79)	5.2103	3.008	572.494	
SO2	35(4,32) - 34(5,29)		176466.428(58)	4.9859	4.300	425.330	
SO2 34S	23(7,17) - 24(6,18)		176940.695(525)	4.9389	3.146	250.791	
SO2 34S	28(8,20) - 29(7,23)		177647.709(850)	4.9225	3.915	358.357	
SO2	50(12,38) - 51(11,41)		177729.555(96)	4.8923	7.426	1053.678	
SO2 V2=1	37(4,34) - 36(5,31)		177865.947(390)	5.0305	4.036	472.262	
SO2 34S	33(9,25) - 34(8,26)		178041.316(1294)	4.9119	4.684	485.141	
SO2 V2=1	24(2,22) - 25(1,25)		178188.020(398)	6.1884	0.182	197.612	
SO2 34S	38(10,28) - 39(9,31)		178238.473(1871)	4.9049	5.452	631.119	
SO2 V2=1	36(5,31) - 35(6,30)		178277.113(422)	4.8617	5.758	466.315	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 34S	39(4,36) - 38(5,33)		178419.410(4583)	5.1596	3.102	518.907	
S02 V2=1	39(4,36) - 38(5,33)		178611.619(444)	5.0979	3.595	521.275	
S02 34S	24(2,22) - 25(1,25)		178845.689(1674)	6.2338	0.161	196.982	
S02	3(3, 1) - 4(2, 2)		179006.139(13)	5.4915	0.127	13.226	
S02 33S	8(4, 4) - 9(3, 7)		179047.625(1620)	5.0565	0.838	43.814	
S02 V2=1	7(2, 6) - 7(1, 7)		179076.303(69)	4.4093	3.307	18.843	
S02 34S	35(4,32) - 34(5,29)		179375.766(1552)	4.9968	3.993	423.500	
S02	24(7,17) - 25(6,20)		179560.967(37)	4.9085	3.366	269.265	
S02 34S	37(5,33) - 36(6,30)		179720.934(1079)	4.8795	5.494	485.817	
S02 V2=1	14(1,13) - 13(2,12)		179941.189(73)	4.5499	4.560	64.744	
S02	24(3,21) - 23(4,20)		180045.404(35)	4.8072	4.217	204.139	
S02	55(13,43) - 56(12,44)		180806.027(168)	4.8681	8.194	1265.080	
S02 V2=1	34(3,31) - 35(2,34)		181262.887(594)	5.9560	0.417	398.607	
S02 V2=1	30(8,22) - 31(7,25)		181308.232(344)	4.8829	4.354	402.522	
S02 V2=1	14(5, 9) - 15(4,12)		181501.930(95)	4.9369	1.822	104.610	
S02 33S	13(5, 9) - 14(4,10)		182112.588(2621)	4.9532	1.604	93.888	
S02	14(1,13) - 13(2,12)	182705.890(100)	182706.072(15)	4.5240	4.583	64.627	[74A]
S02	29(8,22) - 30(7,23)	183582.710(100)	183582.672(42)	4.8708	4.137	380.950	[74A]
S02 34S	9(2, 8) - 9(1, 9)		184287.715(81)	4.3919	3.967	29.033	
S02 34S	37(4,34) - 36(5,31)		184534.256(2708)	5.0293	3.593	469.804	
S02 V2=1	3(3, 1) - 4(2, 2)		184956.688(80)	5.4527	0.127	13.379	
S02	20(2,18) - 20(1,19)	184969.800(100)	184969.824(40)	4.1868	13.576	138.228	[74A]
S02 V2=1	39(5,35) - 38(6,32)		185155.033(406)	4.8455	5.772	538.024	
S02	8(4, 4) - 9(3, 7)	185278.600(100)	185278.404(19)	5.0120	0.838	44.115	[74A]
S02 33S	18(6,12) - 19(5,15)		185280.805(3762)	4.8970	2.375	163.268	
S02 33S	14(1,13) - 13(2,12)		185635.363(916)	4.4971	4.650	64.436	
S02 33S	20(2,18) - 20(1,19)		186179.510(6670)	4.1863	13.331	138.001	
S02 33S	9(2, 8) - 9(1, 9)		186394.953(781)	4.3752	3.984	29.107	
S02	37(4,34) - 36(5,31)		187055.566(66)	4.9685	3.970	471.593	
S02 34S	2(2, 0) - 1(1, 1)		187294.465(101)	4.2203	1.476	2.260	
S02	39(4,36) - 38(5,33)		187338.059(74)	5.0415	3.519	520.644	
S02 V2=1	35(9,27) - 36(8,28)		187360.357(570)	4.8354	5.122	537.270	
S02	30(4,26) - 29(5,25)	187370.330(100)	187370.367(50)	4.7842	4.910	321.458	[74A]
S02	58(9,49) - 57(10,48)		187432.732(139)	4.7931	9.222	1228.369	
S02	34(9,25) - 35(8,28)	187446.750(100)	187446.592(46)	4.8375	4.906	511.989	[74A]
S02 34S	20(2,18) - 20(1,19)		187475.240(101)	4.1851	13.093	137.783	
S02 V2=1	20(2,18) - 20(1,19)	187636.970(100)	187637.055(77)	4.1691	13.662	138.236	[74A]
S02 33S	23(7,17) - 24(6,18)		187817.303(5101)	4.8610	3.147	251.968	
S02 V2=1	19(6,14) - 20(5,15)		188212.773(146)	4.8646	2.595	177.850	
S02 34S	14(1,13) - 13(2,12)		188366.523(81)	4.4720	4.716	64.256	
S02	9(2, 8) - 9(1, 9)		188654.965(13)	4.3576	4.002	29.185	
S02 34S	20(3,17) - 20(2,18)	189123.890(100)	189123.838(105)	4.0956	15.669	144.037	[74A]
S02 34S	22(3,19) - 22(2,20)		189392.482(108)	4.0791	17.787	172.252	
S02 33S	24(3,21) - 23(4,20)		189436.533(2768)	4.7381	4.246	203.498	
S02	53(8,46) - 52(9,43)	189575.300(100)	189575.383(89)	4.7793	8.412	1020.436	[74A]
S02 33S	2(2, 0) - 1(1, 1)		189887.506(293)	4.2022	1.477	2.289	
S02 34S	34(3,31) - 35(2,34)		189943.760(7860)	5.9488	0.365	397.107	
S02	13(5, 9) - 14(4,10)	190148.650(100)	190148.684(26)	4.8969	1.604	94.435	[74A]
S02 33S	28(8,20) - 29(7,23)		190192.189(6724)	4.8332	3.918	359.954	
S02 34S	9(1, 9) - 8(0, 8)	191013.390(100)	191013.365(89)	4.1649	6.008	22.662	[74A]
S02	43(6,38) - 42(7,35)	191020.890(100)	191021.049(71)	4.7782	6.701	662.399	[74A]
S02	39(10,30) - 40(9,31)		191066.990(53)	4.8081	5.675	662.364	
S02	36(5,31) - 35(6,30)	192236.180(100)	192236.277(65)	4.7600	5.753	465.180	[74A]
S02 34S	7(4, 4) - 8(3, 5)		192254.877(149)	5.0326	0.631	37.795	
S02 33S	33(9,25) - 34(8,26)		192259.664(8916)	4.8113	4.689	487.198	
S02 33S	9(1, 9) - 8(0, 8)		192272.289(833)	4.1581	5.983	22.694	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 V2=1	9(2, 8) - 9(1, 9)	192612.430(100)	192612.402(70)	4.3336	4.008	29.190	[74A]
S02	2(2, 0) - 1(1, 1)	192651.020(80)	192650.945(10)	4.1832	1.478	2.321	[70A]
S02	9(1, 9) - 8(0, 8)	193609.490(100)	193609.418(15)	4.1510	5.957	22.727	[74A]
S02 V2=1	8(4, 4) - 9(3, 7)		193630.801(86)	4.9582	0.838	44.449	
S02 V2=1	9(1, 9) - 8(0, 8)		194268.852(81)	4.1509	5.948	22.710	
S02 34S	12(5, 7) - 13(4,10)		194416.834(215)	4.8978	1.387	84.417	
S02	44(11,33) - 45(10,36)		194491.635(72)	4.7815	6.444	832.048	
S02 34S	18(3,15) - 18(2,16)	194812.060(100)	194812.086(119)	4.0854	13.245	118.366	[74A]
S02 V2=1	24(7,17) - 25(6,20)		194994.176(249)	4.8046	3.367	270.532	
S02	18(6,12) - 19(5,15)	195080.440(100)	195080.357(34)	4.8298	2.376	164.140	[74A]
S02	22(3,19) - 22(2,20)		195320.373(61)	4.0420	17.661	172.676	
S02 34S	17(6,12) - 18(5,13)		195742.453(363)	4.8433	2.156	150.305	
S02 V2=1	2(2, 0) - 1(1, 1)		196177.869(86)	4.1631	1.478	2.360	
S02 34S	22(7,15) - 23(6,18)		196854.977(624)	4.8123	2.928	235.435	
S02 34S	24(3,21) - 24(2,22)	197044.300(100)	197044.303(164)	4.0295	19.278	202.948	[74A]
S02	20(3,17) - 20(2,18)	197142.180(100)	197142.010(56)	4.0488	15.407	144.397	[74A]
S02 34S	27(8,20) - 28(7,21)		197556.127(1014)	4.7933	3.698	339.802	
S02	39(5,35) - 38(6,32)		197585.508(68)	4.7597	5.739	536.946	
S02	49(12,38) - 50(11,39)	197709.450(100)	197709.734(112)	4.7575	7.213	1021.014	[74A]
S02 34S	32(9,23) - 33(8,26)		198019.504(1552)	4.7807	4.468	463.387	
S02 33S	7(4, 4) - 8(3, 5)		198124.072(1931)	4.9935	0.631	38.073	
S02 34S	37(10,28) - 38(9,29)		198217.990(2254)	4.7726	5.236	606.169	
S02 34S	24(3,21) - 23(4,20)	198348.540(100)	198348.557(111)	4.6749	4.277	202.904	[74A]
S02	42(6,36) - 41(7,35)	198847.860(100)	198847.826(80)	4.7176	6.674	635.281	[74A]
S02 33S	18(3,15) - 18(2,16)		199331.711(7562)	4.0600	13.107	118.520	
S02	23(7,17) - 24(6,18)		199415.895(42)	4.7828	3.148	253.243	
S02 33S	30(4,26) - 29(5,25)		199649.246(4172)	4.7012	4.915	320.452	
S02 V2=1	22(3,19) - 22(2,20)		199757.035(130)	4.0172	17.631	172.770	
S02	24(3,21) - 24(2,22)	200287.530(80)	200287.396(65)	4.0055	19.398	203.463	[70A]
S02	54(13,41) - 55(12,44)		200727.869(185)	4.7354	7.981	1229.229	
S02	16(1,15) - 16(0,16)	200809.182(150)	200809.324(27)	4.3283	6.165	84.118	[70A]
S02 V2=1	13(5, 9) - 14(4,10)		200888.303(109)	4.8290	1.604	95.018	
S02 V2=1	29(8,22) - 30(7,23)		201308.469(423)	4.7542	4.137	382.660	
S02 34S	11(2,10) - 11(1,11)		201376.451(97)	4.3048	4.498	41.754	
S02 33S	12(5, 7) - 13(4,10)		201925.068(3228)	4.8484	1.387	84.925	
S02 V2=1	20(3,17) - 20(2,18)	201972.180(100)	201972.059(111)	4.0224	15.356	144.495	[74A]
S02 33S	16(1,15) - 16(0,16)		202186.215(1922)	4.3281	6.044	83.947	
S02 V2=1	12(0,12) - 11(1,11)	202562.470(100)	202562.277(78)	4.0654	8.407	41.943	[74A]
S02 34S	3(2, 2) - 2(1, 1)	203225.140(100)	203225.102(106)	4.2074	1.667	3.637	[74A]
S02 33S	11(2,10) - 11(1,11)		203265.979(1210)	4.2900	4.525	41.852	
S02	12(0,12) - 11(1,11)	203391.550(100)	203391.488(15)	4.0553	8.428	41.953	[74A]
S02 34S	16(1,15) - 16(0,16)		203504.143(141)	4.3277	5.932	83.781	
S02	59(14,46) - 60(13,47)		203543.262(326)	4.7155	8.750	1456.659	
S02	28(8,20) - 29(7,23)	203570.150(100)	203570.035(48)	4.7446	3.919	361.720	[74A]
S02 V2=1	16(1,15) - 16(0,16)	203652.700(100)	203652.393(88)	4.3107	6.209	84.044	[74A]
S02 33S	12(0,12) - 11(1,11)		203789.346(967)	4.0498	8.485	41.852	
S02 34S	12(0,12) - 11(1,11)		204136.246(87)	4.0448	8.540	41.754	
S02	18(3,15) - 18(2,16)		204246.715(51)	4.0331	12.964	118.685	
S02 V2=1	24(3,21) - 24(2,22)	204331.670(100)	204331.744(154)	3.9830	19.409	203.555	[74A]
S02	7(4, 4) - 8(3, 5)	204384.300(100)	204384.262(21)	4.9532	0.630	38.368	[74A]
S02 34S	16(3,13) - 16(2,14)		204525.227(127)	4.0584	10.861	95.294	
S02 33S	17(6,12) - 18(5,13)		204928.570(4774)	4.7835	2.157	151.110	
S02	11(2,10) - 11(1,11)	205300.570(100)	205300.525(17)	4.2743	4.554	41.953	[74A]
S02 33S	3(2, 2) - 2(1, 1)		205876.428(318)	4.1905	1.667	3.666	
S02 33S	36(5,31) - 35(6,30)		206587.283(5483)	4.6676	5.737	463.701	
S02	59(9,51) - 58(10,48)		206786.918(148)	4.6648	9.384	1265.611	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 V2=1	34(9,25) - 35(8,28)		207420.967(694)	4.7091	4.907	514.207	
S02	33(9,25) - 34(8,26)	207421.380(150)	207421.311(54)	4.7124	4.690	489.557	[70A]
S02 33S	22(7,15) - 23(6,18)		207702.387(6567)	4.7422	2.929	236.603	
S02 V2=1	18(6,12) - 19(5,15)		208172.406(173)	4.7488	2.376	165.037	
S02	48(7,41) - 47(8,40)	208302.800(150)	208302.613(101)	4.6565	7.626	831.728	[70A]
S02	3(2, 2) - 2(1, 1)	208700.320(150)	208700.338(11)	4.1727	1.667	3.697	[70A]
S02 33S	16(3,13) - 16(2,14)		209425.508(4820)	4.0320	10.750	95.437	
S02 V2=1	18(3,15) - 18(2,16)		209433.742(98)	4.0058	12.912	118.788	
S02 V2=1	11(2,10) - 11(1,11)		209454.195(73)	4.2509	4.564	41.943	
S02	53(5,49) - 52(6,46)	209874.370(150)	209874.477(227)	5.1001	2.964	952.988	[70A]
S02	12(5, 7) - 13(4,10)	209936.050(150)	209936.135(29)	4.7978	1.387	85.465	[70A]
S02 33S	27(8,20) - 28(7,21)		210076.498(8733)	4.7130	3.701	341.390	
S02 34S	39(5,35) - 38(6,32)		210817.635(1905)	4.6911	5.533	534.235	
S02	38(10,28) - 39(9,31)	211053.100(80)	211052.936(63)	4.6842	5.460	636.731	[70A]
S02 34S	30(4,26) - 29(5,25)		211418.557(371)	4.6258	4.924	319.551	
S02 34S	6(4, 2) - 7(3, 5)		211762.877(169)	5.0073	0.434	32.683	
S02 V2=1	3(2, 2) - 2(1, 1)		212177.502(92)	4.1549	1.667	3.737	
S02 V2=1	7(4, 4) - 8(3, 5)		212726.123(96)	4.9047	0.630	38.706	
S02 34S	26(3,23) - 26(2,24)		212981.438(280)	3.9467	19.982	236.057	
S02	26(3,23) - 26(2,24)	213068.400(150)	213068.438(69)	3.9370	20.405	236.696	[70A]
S02 V2=1	39(10,30) - 40(9,31)		213246.574(1100)	4.6686	5.676	665.152	
S02	49(7,43) - 48(8,40)	213703.000(150)	213703.006(93)	4.6266	7.723	862.649	[70A]
S02 34S	11(5, 7) - 12(4, 8)		213807.545(247)	4.8107	1.172	76.115	
S02	43(11,33) - 44(10,34)	214451.890(80)	214451.799(85)	4.6591	6.229	803.219	[70A]
S02	16(3,13) - 16(2,14)	214689.380(150)	214689.359(44)	4.0043	10.637	95.589	[70A]
S02	17(6,12) - 18(5,13)	214728.330(150)	214728.363(38)	4.7226	2.157	151.971	[70A]
S02 V2=1	23(7,17) - 24(6,18)		214835.947(299)	4.6894	3.149	254.520	
S02	26(2,24) 27(1,27)	215094.540(150)	215094.182(146)	6.0517	0.152	229.521	[70A]
S02 34S	16(6,10) - 17(5,13)		215468.510(421)	4.7390	1.938	138.796	
S02 34S	14(3,11) - 14(2,12)		215999.777(124)	4.0251	8.750	74.869	
S02 34S	21(7,15) - 22(6,16)		216594.080(725)	4.7017	2.709	220.727	
S02	22(2,20) - 22(1,21)		216643.328(46)	4.0329	13.218	165.450	
S02 V2=1	26(3,23) - 26(2,24)		216758.568(183)	3.9170	20.470	236.787	
S02 34S	26(8,18) - 27(7,21)		217413.889(1185)	4.6788	3.480	321.892	
S02 33S	6(4, 2) - 7(3, 5)		217627.088(2223)	4.9718	0.434	32.956	
S02	48(12,36) - 49(11,39)		217633.770(128)	4.6366	6.998	988.993	
S02 34S	31(9,23) - 32(8,24)		217903.891(1821)	4.6641	4.251	442.278	
S02 34S	36(10,26) - 37(9,29)		218131.635(2656)	4.6544	5.020	581.864	
S02 V2=1	20(2,18) - 19(3,17)		218995.898(101)	4.4415	4.590	137.190	
S02	22(7,15) - 23(6,18)		219276.000(47)	4.6715	2.929	237.864	
S02 34S	11(1,11) - 10(0,10)		219355.066(101)	3.9548	7.790	34.437	
S02 V2=1	22(2,20) - 22(1,21)		219465.564(102)	4.0165	13.319	165.450	
S02	54(8,46) - 53(9,45)	220102.680(150)	220102.285(143)	4.5838	8.588	1054.480	[70A]
S02 V2=1	16(3,13) - 16(2,14)		220165.240(90)	3.9768	10.598	95.698	
S02 34S	36(5,31) - 35(6,30)		220450.609(1066)	4.5839	5.724	462.450	
S02	53(13,41) - 54(12,42)		220598.385(206)	4.6162	7.768	1194.020	
S02 33S	11(1,11) - 10(0,10)		220618.295(1209)	3.9495	7.751	34.493	
S02	56(5,51) - 57(4,54)		220618.348(980)	5.6003	0.850	1075.502	
S02 V2=1	12(5, 7) - 13(4,10)		220657.850(125)	4.7366	1.387	86.054	
S02 33S	14(3,11) - 14(2,12)		220983.822(3003)	3.9989	8.678	75.005	
S02 34S	22(2,20) - 22(1,21)		221114.984(117)	4.0248	12.669	164.876	
S02 V2=1	28(8,20) - 29(7,23)		221277.992(507)	4.6395	3.920	363.443	
S02 33S	11(5, 7) - 12(4, 8)		221325.703(3878)	4.7657	1.172	76.616	
S02 34S	13(2,12) - 13(1,13)		221735.674(122)	4.2125	4.892	56.859	
S02	11(1,11) - 10(0,10)	221965.210(150)	221965.211(21)	3.9439	7.711	34.549	[70A]
S02 V2=1	11(1,11) - 10(0,10)		222424.385(88)	3.9456	7.697	34.523	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
SO2	36(3,33) - 37(2,36)		222868.588(208)	5.7723	0.359	443.365	
SO2	58(14,44) - 59(13,47)		223347.674(343)	4.5979	8.537	1418.267	
SO2 33S	13(2,12) - 13(1,13)		223376.787(1870)	4.1994	4.931	56.985	
SO2	27(8,20) - 28(7,21)	223434.470(150)	223434.428(55)	4.6326	3.701	343.137	[70A]
SO2	6(4, 2) - 7(3, 5)		223883.643(23)	4.9351	0.433	33.247	
SO2	20(2,18) - 19(3,17)		224264.900(31)	4.4044	4.615	136.917	
SO2	46(4,42) - 47(3,45)		224472.883(418)	5.6489	0.594	725.448	
SO2 33S	16(6,10) - 17(5,13)		224636.668(5869)	4.6846	1.939	139.592	
SO2	13(2,12) - 13(1,13)		225153.688(23)	4.1856	4.971	57.117	
SO2 34S	26(2,24) - 27(1,27)		225582.006(3070)	6.0316	0.138	228.533	
SO2 V2=1	26(2,24) - 27(1,27)		225833.365(570)	5.9843	0.155	229.254	
SO2	14(3,11) - 14(2,12)		226300.006(37)	3.9716	8.606	75.150	
SO2	41(5,37) - 40(6,34)		226508.510(86)	4.6047	5.718	588.068	
SO2 34S	12(3, 9) - 12(2,10)		227031.936(112)	3.9941	6.976	57.123	
SO2	32(9,23) - 33(8,26)		227335.637(62)	4.6004	4.473	467.770	
SO2 V2=1	33(9,25) - 34(8,26)		227378.645(827)	4.5963	4.691	491.789	
SO2 33S	21(7,15) - 22(6,16)		227428.582(8223)	4.6380	2.710	221.885	
SO2 V2=1	17(6,12) - 18(5,13)		227808.338(202)	4.6492	2.157	152.876	
SO2	11(5, 7) - 12(4, 8)		229347.727(33)	4.7194	1.172	77.149	
SO2 V2=1	13(2,12) - 13(1,13)		229545.207(79)	4.1629	4.985	57.087	
SO2	45(6,40) - 44(7,37)		229749.883(96)	4.5451	6.892	718.486	
SO2 34S	4(2, 2) - 3(1, 3)		229857.660(114)	4.1463	1.705	5.311	
SO2 33S	20(2,18) - 19(3,17)		230435.113(3005)	4.3622	4.690	136.525	
SO2 34S	5(4, 2) - 6(3, 3)		230933.484(187)	5.0550	0.253	28.220	
SO2	37(10,28) - 38(9,29)		230965.061(74)	4.5729	5.243	611.744	
SO2 33S	12(3, 9) - 12(2,10)		231896.574(1899)	3.9690	6.937	57.256	
SO2 V2=1	14(3,11) - 14(2,12)		231980.484(86)	3.9442	8.581	75.267	
SO2 V2=1	6(4, 2) - 7(3, 5)		232210.221(106)	4.8912	0.433	33.589	
SO2 33S	4(2, 2) - 3(1, 3)		232419.746(376)	4.1306	1.710	5.346	
SO2 V2=1	38(10,28) - 39(9,31)		233213.531(1298)	4.5577	5.460	639.537	
SO2 34S	10(5, 5) - 11(4, 8)		233296.637(281)	4.7434	0.962	68.450	
SO2	55(8,48) - 54(9,45)		233345.373(131)	4.5090	8.719	1089.213	
SO2	60(9,51) - 59(10,50)		233400.717(234)	4.5065	9.554	1303.488	
SO2 V2=1	16(1,15) - 15(2,14)		233724.926(84)	4.1448	6.018	83.041	
SO2	28(3,25) - 28(2,26)		234187.121(74)	3.8401	20.659	272.311	
SO2	42(11,31) - 43(10,34)		234352.982(99)	4.5487	6.013	775.035	
SO2	16(6,10) - 17(5,13)		234421.674(43)	4.6291	1.938	140.444	
SO2 V2=1	22(7,15) - 23(6,18)		234679.006(351)	4.5867	2.930	239.152	
SO2 34S	15(6,10) - 16(5,11)		235004.430(480)	4.6503	1.721	127.933	
SO2	4(2, 2) - 3(1, 3)		235151.719(12)	4.1141	1.715	5.382	
SO2 V2=1	36(3,33) - 37(2,36)		235342.352(860)	5.6970	0.366	443.151	
SO2 34S	5(2, 4) - 4(1, 3)		235927.553(114)	4.1036	2.126	8.270	
SO2 34S	10(3, 7) - 10(2, 8)		235951.977(100)	3.9731	5.479	42.076	
SO2	16(1,15) - 15(2,14)		236216.725(24)	4.1247	6.053	82.937	
SO2 34S	20(2,18) - 19(3,17)		236225.133(94)	4.3229	4.765	136.157	
SO2 34S	20(7,13) - 21(6,16)		236296.377(830)	4.6041	2.491	206.661	
SO2 33S	5(4, 2) - 6(3, 3)		236813.979(2494)	5.0224	0.253	28.489	
SO2 V2=1	26(3,23) - 25(4,22)		237062.285(196)	4.4265	4.842	236.109	
SO2	12(3, 9) - 12(2,10)	237068.870(150)	237068.826(28)	3.9427	6.898	57.398	[70A]
SO2 34S	25(8,18) - 26(7,19)		237170.236(1359)	4.5770	3.262	304.627	
SO2	47(12,36) - 48(11,37)		237502.381(147)	4.5273	6.783	957.615	
SO2 34S	28(3,25) - 28(2,26)		237521.217(486)	3.8367	19.961	271.518	
SO2 V2=1	28(3,25) - 28(2,26)		237602.139(219)	3.8226	20.777	272.402	
SO2 34S	30(9,21) - 31(8,24)		237723.604(2099)	4.5595	4.033	421.813	
SO2 34S	35(10,26) - 36(9,27)		237973.779(3074)	4.5482	4.803	558.202	
SO2	17(3,15) - 18(0,18)		238166.313(48)	5.8362	0.122	105.299	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 33S	5(2, 4) - 4(1, 3)		238683.346(511)	4.0887	2.125	8.302	
S02 V2=1	4(2, 2) - 3(1, 3)		238697.643(102)	4.0978	1.717	5.417	
S02 33S	16(1,15) - 15(2,14)		238965.713(1889)	4.1025	6.153	82.720	
S02	21(7,15) - 22(6,16)		238992.563(54)	4.5734	2.710	223.132	
S02 V2=1	38(5,33) - 37(6,32)		239752.180(687)	4.4730	6.111	513.278	
S02	15(3,13) - 16(0,16)		239832.766(40)	5.8546	0.101	84.118	
S02 V2=1	11(5, 7) - 12(4, 8)		240057.410(141)	4.6636	1.172	77.743	
S02	52(13,39) - 53(12,42)		240420.473(229)	4.5081	7.553	1159.453	
S02 33S	10(3, 7) - 10(2, 8)		240611.418(1199)	3.9491	5.460	42.207	
S02 33S	10(5, 5) - 11(4, 8)		240810.852(4535)	4.7022	0.962	68.944	
S02	18(1,17) - 18(0,18)		240942.793(37)	4.1534	5.985	105.299	
S02	51(5,47) - 50(6,44)		241044.820(208)	4.8260	3.539	885.168	
S02 V2=1	27(8,20) - 28(7,21)		241126.754(596)	4.5369	3.702	344.872	
S02 V2=1	32(4,28) - 31(5,27)		241193.633(390)	4.4483	5.363	361.477	
S02 34S	16(1,15) - 15(2,14)		241509.053(102)	4.0818	6.251	82.513	
S02	5(2, 4) - 4(1, 3)		241615.795(13)	4.0729	2.124	8.336	
S02 34S	8(3, 5) - 8(2, 6)		241985.508(99)	3.9687	4.154	29.724	
S02 33S	18(1,17) - 18(0,18)		242484.951(3403)	4.1532	5.876	105.078	
S02 V2=1	12(3, 9) - 12(2,10)		242872.805(85)	3.9157	6.884	57.523	
S02	19(3,17) - 20(0,20)		242997.719(59)	5.8162	0.134	128.811	
S02	5(4, 2) - 6(3, 3)		243087.723(25)	4.9886	0.253	28.776	
S02	57(14,44) - 58(13,45)		243108.803(366)	4.4910	8.322	1380.517	
S02	26(8,18) - 27(7,21)		243245.363(63)	4.5323	3.483	325.199	
S02 V2=1	14(0,14) - 13(1,13)		243522.635(86)	3.7940	10.483	57.087	
S02 34S	18(1,17) - 18(0,18)		243935.881(209)	4.1530	5.774	104.865	
S02 33S	15(6,10) - 16(5,11)		244170.955(7049)	4.6004	1.721	128.722	
S02	14(0,14) - 13(1,13)		244254.229(24)	3.7855	10.506	57.117	
S02 V2=1	18(1,17) - 18(0,18)		244386.477(122)	4.1358	6.025	105.200	
S02 33S	14(0,14) - 13(1,13)		244387.209(1667)	3.7823	10.568	56.985	
S02 34S	14(0,14) - 13(1,13)		244481.543(109)	3.7793	10.627	56.859	
S02 V2=1	5(2, 4) - 4(1, 3)		245002.656(104)	4.0585	2.124	8.374	
S02 34S	15(2,14) - 15(1,15)		245178.680(155)	4.1176	5.169	74.335	
S02 34S	6(3, 3) - 6(2, 4)		245302.299(111)	3.9903	2.902	20.038	
S02	26(3,23) - 25(4,22)		245339.404(48)	4.3762	4.862	235.619	
S02	10(3, 7) - 10(2, 8)		245563.428(21)	3.9241	5.441	42.347	
S02 33S	8(3, 5) - 8(2, 6)		246455.258(675)	3.9457	4.146	29.852	
S02 33S	15(2,14) - 15(1,15)		246555.369(2959)	4.1061	5.219	74.495	
S02 34S	4(3, 1) - 4(2, 2)		246686.182(128)	4.0777	1.615	12.979	
S02 34S	3(3, 1) - 3(2, 2)		247127.455(136)	4.2240	0.892	10.416	
S02	31(9,23) - 32(8,24)		247169.598(72)	4.4996	4.254	446.629	
S02 V2=1	32(9,23) - 33(8,26)		247275.186(967)	4.4945	4.473	470.017	
S02 34S	5(3, 3) - 5(2, 4)		247440.355(120)	4.0141	2.265	16.140	
S02 V2=1	16(6,10) - 17(5,13)		247485.443(232)	4.5621	1.938	141.357	
S02	15(2,14) - 15(1,15)		248057.385(31)	4.0939	5.271	74.663	
S02 34S	7(3, 5) - 7(2, 6)		248364.816(105)	3.9568	3.484	24.398	
S02	13(3,11) - 14(0,14)		248436.900(33)	5.8850	0.074	65.264	
S02 34S	13(1,13) - 12(0,12)		248698.748(117)	3.7642	9.732	48.564	
S02	10(5, 5) - 11(4, 8)		248830.928(36)	4.6597	0.961	69.471	
S02	43(5,39) - 42(6,36)		248995.338(105)	4.5152	5.545	641.914	
S02 34S	30(4,26) - 30(3,27)		249099.816(1139)	3.7301	23.670	318.295	
S02 33S	6(3, 3) - 6(2, 4)		249649.805(379)	3.9679	2.898	20.162	
S02 33S	13(1,13) - 12(0,12)		249906.252(1784)	3.7601	9.684	48.649	
S02 34S	4(4, 0) - 5(3, 3)		250156.182(204)	5.2611	0.102	24.394	
S02 34S	9(3, 7) - 9(2, 8)		250358.420(98)	3.9232	4.655	35.180	
S02	36(10,26) - 37(9,29)		250816.590(86)	4.4721	5.026	587.402	
S02 33S	4(3, 1) - 4(2, 2)		250978.389(552)	4.0555	1.614	13.098	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	13(1,13) - 12(0,12)		251199.668(28)	3.7556	9.633	48.738	
S02	8(3, 5) - 8(2, 6)		251210.600(16)	3.9217	4.137	29.988	
S02 V2=1	5(4, 2) - 6(3, 3)		251401.277(117)	4.9485	0.253	29.121	
S02 33S	3(3, 1) - 3(2, 2)		251401.430(692)	4.2019	0.892	10.533	
S02 V2=1	10(3, 7) - 10(2, 8)		251428.459(89)	3.8976	5.435	42.481	
S02 V2=1	13(1,13) - 12(0,12)		251450.133(93)	3.7588	9.615	48.700	
S02 33S	5(3, 3) - 5(2, 4)		251702.414(424)	3.9921	2.263	16.263	
S02 34S	32(4,28) - 32(3,29)		251758.973(1498)	3.7098	25.600	359.653	
S02	32(4,28) - 31(5,27)		252564.113(66)	4.3838	5.371	360.710	
S02 33S	7(3, 5) - 7(2, 6)		252591.252(465)	3.9352	3.481	24.531	
S02 34S	9(5, 5) - 10(4, 6)		252615.629(313)	4.7000	0.758	61.430	
S02 V2=1	15(2,14) - 15(1,15)		252730.938(91)	4.0718	5.289	74.610	
S02 V2=1	37(10,28) - 38(9,29)		253107.303(1508)	4.4572	5.244	614.566	
S02	21(3,19) - 22(0,22)		253753.311(76)	5.7880	0.138	154.658	
S02	38(5,33) - 37(6,32)		253936.047(88)	4.3945	6.108	512.173	
S02 34S	11(3, 9) - 11(2,10)		253936.346(106)	3.8930	5.790	48.472	
S02	15(6,10) - 16(5,11)		253956.662(49)	4.5493	1.721	129.563	
S02	41(11,31) - 42(10,32)		254194.850(114)	4.4485	5.796	747.495	
S02 34S	28(4,24) - 28(3,25)		254278.109(831)	3.7224	21.164	279.441	
S02	6(3, 3) - 6(2, 4)		254280.557(14)	3.9445	2.894	20.294	
S02	24(2,22) - 24(1,23)		254283.373(55)	3.8772	12.737	194.981	
S02 V2=1	21(7,15) - 22(6,16)		254381.104(406)	4.4957	2.710	224.430	
S02 33S	9(3, 7) - 9(2, 8)		254509.293(902)	3.9021	4.651	35.325	
S02 34S	14(6, 8) - 15(5,11)		254517.240(539)	4.5754	1.506	117.712	
S02 33S	26(3,23) - 25(4,22)		255277.314(7188)	4.3195	4.920	234.949	
S02	4(3, 1) - 4(2, 2)		255553.328(14)	4.0323	1.613	13.226	
S02	51(7,45) - 50(8,42)		255595.350(130)	4.3971	7.966	926.393	
S02	44(6,38) - 43(7,37)		255818.387(118)	4.3893	6.988	689.988	
S02 34S	19(7,13) - 20(6,14)		255893.082(935)	4.5184	2.273	193.241	
S02	3(3, 1) - 3(2, 2)		255958.072(15)	4.1787	0.891	10.659	
S02 33S	4(4, 0) - 5(3, 3)		256047.961(2729)	5.2309	0.101	24.659	
S02	5(3, 3) - 5(2, 4)		256246.969(14)	3.9692	2.261	16.395	
S02 34S	24(8,16) - 25(7,19)		256865.617(1538)	4.4858	3.043	288.005	
S02 V2=1	8(3, 5) - 8(2, 6)		257099.244(95)	3.8955	4.134	30.130	
S02	7(3, 5) - 7(2, 6)		257099.982(14)	3.9126	3.477	24.671	
S02	46(12,34) - 47(11,37)		257319.402(167)	4.4277	6.567	926.881	
S02 V2=1	24(2,22) - 24(1,23)		257420.244(144)	3.8616	12.840	194.969	
S02 34S	29(9,21) - 30(8,22)		257468.777(2383)	4.4653	3.814	401.993	
S02 34S	39(11,29) - 40(10,30)		257745.744(4931)	4.4432	5.356	687.560	
S02 34S	34(10,24) - 35(9,27)		257754.443(3505)	4.4519	4.585	535.185	
S02 33S	11(3, 9) - 11(2,10)		257955.818(1519)	3.8727	5.787	48.632	
S02	32(4,28) - 32(3,29)		258388.809(124)	3.6773	25.519	360.516	
S02	20(7,13) - 21(6,16)		258667.002(61)	4.4862	2.491	209.045	
S02	9(3, 7) - 9(2, 8)		258942.207(18)	3.8800	4.647	35.478	
S02 V2=1	10(5, 5) - 11(4, 8)		259525.488(157)	4.6085	0.961	70.070	
S02	30(4,26) - 30(3,27)		259599.475(109)	3.6835	23.277	319.048	
S02 34S	13(3,11) - 13(2,12)		259617.227(124)	3.8597	6.866	64.256	
S02 33S	9(5, 5) - 10(4, 6)		260138.340(5193)	4.6619	0.757	61.918	
S02 V2=1	6(3, 3) - 6(2, 4)		260176.047(103)	3.9185	2.893	20.442	
S02	51(13,39) - 52(12,40)		260195.814(254)	4.4094	7.337	1125.529	
S02	49(5,45) - 48(6,42)		260269.496(180)	4.6397	4.149	820.138	
S02 34S	24(2,22) - 24(1,23)		260327.004(215)	3.8657	12.193	194.264	
S02 V2=1	26(8,18) - 27(7,21)		260920.957(687)	4.4445	3.483	326.946	
S02	50(7,43) - 49(8,42)		261062.504(163)	4.3628	7.931	894.126	
S02	27(4,24) - 28(1,27)		261091.104(103)	5.5071	0.310	260.960	
S02 V2=1	4(3, 1) - 4(2, 2)		261450.152(109)	4.0064	1.612	13.379	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
SO2 V2=1	3(3, 1) - 3(2, 2)		261855.119(111)	4.1528	0.891	10.814	
SO2 V2=1	5(3, 3) - 5(2, 4)		262144.793(106)	3.9433	2.260	16.546	
SO2	11(3, 9) - 11(2,10)		262256.902(25)	3.8514	5.784	48.802	
SO2	4(4, 0) - 5(3, 3)		262334.043(27)	5.1995	0.101	24.943	
SO2	28(2,26) - 29(1,29)		262524.359(205)	5.8796	0.134	263.554	
SO2	56(14,42) - 57(13,45)		262828.590(394)	4.3931	8.107	1343.407	
SO2	25(8,18) - 26(7,19)		262969.660(72)	4.4423	3.263	307.907	
SO2 V2=1	7(3, 5) - 7(2, 6)		262999.680(100)	3.8869	3.476	24.816	
SO2	45(5,41) - 44(6,38)		263216.676(127)	4.4895	5.209	698.521	
SO2 34S	34(4,30) - 34(3,31)		263436.520(1975)	3.6584	26.698	403.443	
SO2 33S	13(3,11) - 13(2,12)		263436.945(2467)	3.8406	6.869	64.436	
SO2	30(3,27) - 30(2,28)		263544.090(82)	3.7227	20.330	310.258	
SO2 33S	14(6, 8) - 15(5,11)		263678.922(8283)	4.5293	1.506	118.492	
SO2	25(4,22) - 26(1,25)		263897.785(97)	5.5107	0.276	226.817	
SO2 V2=1	32(4,28) - 32(3,29)		264129.305(420)	3.6529	25.484	360.712	
SO2	11(3, 9) - 12(0,12)		264165.941(27)	5.9505	0.045	48.738	
SO2 34S	26(3,23) - 25(4,22)		264682.879(220)	4.2669	4.981	234.333	
SO2 V2=1	9(3, 7) - 9(2, 8)		264846.152(93)	3.8545	4.646	35.615	
SO2	29(4,26) - 30(1,29)		265461.395(114)	5.4904	0.328	297.418	
SO2	34(4,30) - 34(3,31)		265482.156(149)	3.6426	27.052	404.456	
SO2 34S	26(4,22) - 26(3,23)		265488.996(567)	3.6940	18.458	243.162	
SO2 34S	7(2, 6) - 6(1, 5)		265554.117(123)	3.9837	2.679	15.540	
SO2	47(6,42) - 46(7,39)		265608.500(127)	4.3684	6.994	777.237	
SO2 V2=1	30(4,26) - 30(3,27)		266030.289(376)	3.6569	23.194	319.247	
SO2 V2=1	30(3,27) - 30(2,28)		266815.348(268)	3.7071	20.487	310.347	
SO2	30(9,21) - 31(8,24)		266943.145(83)	4.4082	4.036	426.133	
SO2 V2=1	15(6,10) - 16(5,11)		267006.727(263)	4.4877	1.721	130.484	
SO2 V2=1	31(9,23) - 32(8,24)		267092.133(1112)	4.4022	4.255	448.890	
SO2	47(5,43) - 46(6,40)		267428.527(151)	4.5296	4.728	757.923	
SO2	13(3,11) - 13(2,12)		267537.441(33)	3.8203	6.870	64.627	
SO2	28(4,24) - 28(3,25)		267719.828(101)	3.6662	20.638	280.123	
SO2 34S	15(3,13) - 15(2,14)		267871.090(143)	3.8205	7.855	82.513	
SO2	9(5, 5) - 10(4, 6)		268168.445(40)	4.6224	0.757	62.438	
SO2 V2=1	11(3, 9) - 11(2,10)		268169.750(88)	3.8261	5.782	48.929	
SO2 33S	7(2, 6) - 6(1, 5)		268450.324(884)	3.9701	2.676	15.576	
SO2	56(8,48) - 55(9,47)		269761.922(238)	4.3190	8.897	1124.547	
SO2	23(3,21) - 24(0,24)		269786.211(99)	5.7504	0.137	182.843	
SO2 34S	30(3,27) - 30(2,28)		270229.680(868)	3.7092	19.458	309.281	
SO2	57(7,51) - 58(4,54)		270230.824(3840)	5.2503	1.054	1136.818	
SO2 V2=1	34(4,30) - 34(3,31)		270527.617(465)	3.6211	27.091	404.654	
SO2	35(10,26) - 36(9,27)		270605.301(99)	4.3804	4.808	563.704	
SO2 V2=1	4(4, 0) - 5(3, 3)		270633.648(127)	5.1627	0.101	25.290	
SO2 34S	17(2,16) - 17(1,17)		271410.168(199)	4.0224	5.356	94.171	
SO2 33S	15(3,13) - 15(2,14)		271415.992(4105)	3.8027	7.867	82.720	
SO2	7(2, 6) - 6(1, 5)		271529.008(17)	3.9558	2.672	15.614	
SO2	55(7,49) - 56(4,52)		271691.563(3534)	5.2507	1.000	1063.899	
SO2	37(5,33) - 38(2,36)		271726.613(338)	5.3521	0.535	484.919	
SO2 34S	8(5, 3) - 9(4, 6)		271917.105(345)	4.6852	0.562	55.049	
SO2 33S	17(2,16) - 17(1,17)		272524.395(4746)	4.0123	5.416	94.371	
SO2 34S	28(2,26) - 29(1,29)		272787.563(5291)	5.8682	0.123	262.419	
SO2 V2=1	36(10,26) - 37(9,29)		272940.418(1726)	4.3656	5.026	590.240	
SO2	14(6, 8) - 15(5,11)		273462.770(54)	4.4820	1.506	119.325	
SO2 V2=1	13(3,11) - 13(2,12)		273467.363(86)	3.7954	6.871	64.744	
SO2	17(2,16) - 17(1,17)		273752.938(40)	4.0015	5.477	94.581	
SO2 34S	13(6, 8) - 14(5, 9)		273930.496(598)	4.5145	1.294	108.134	
SO2	40(11,29) - 41(10,32)		273982.609(131)	4.3568	5.579	720.599	

TABLE 1. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 V2=1	20(7,13) - 21(6,16)		274039.730(461)	4.4147	2.491	210.352	
S02	47(6,42) - 48(3,45)		274077.445(1344)	5.2768	0.786	776.955	
S02	35(5,31) - 36(2,34)		274521.906(280)	5.3513	0.492	437.827	
S02	23(4,20) - 24(1,23)		274525.367(95)	5.5074	0.228	194.981	
S02 V2=1	28(2,26) - 29(1,29)		274745.570(786)	5.8170	0.136	263.237	
S02 V2=1	28(4,24) - 28(3,25)		274778.266(330)	3.6381	20.539	280.327	
S02 V2=1	7(2, 6) - 6(1, 5)		274789.273(113)	3.9441	2.671	15.650	
S02	15(3,13) - 15(2,14)		275240.164(43)	3.7839	7.878	82.937	
S02	38(3,35) - 39(2,38)		275374.762(330)	5.5647	0.324	490.297	
S02 34S	18(7,11) - 19(6,14)		275435.098(1040)	4.4433	2.056	180.463	
S02	31(4,28) - 32(1,31)		276254.469(131)	5.4594	0.334	336.198	
S02	45(6,40) - 46(3,43)		276303.164(1180)	5.2756	0.737	716.934	
S02 34S	23(8,16) - 24(7,17)		276485.449(1718)	4.4042	2.825	272.028	
S02	39(5,35) - 40(2,38)		276558.891(403)	5.3338	0.558	534.312	
S02	59(7,53) - 60(4,56)		276867.672(4148)	5.2229	1.080	1212.004	
S02	57(8,50) - 56(9,47)	276992.840(200)	276992.844(192)	4.2875	8.994	1160.605	[70A]
S02 34S	6(2, 4) - 5(1, 5)		276999.625(127)	4.0285	1.845	10.798	
S02	45(12,34) - 46(11,35)	277085.960(200)	277086.512(189)	4.3364	6.350	896.789	[70A]
S02 34S	28(9,19) - 29(8,22)		277152.902(2673)	4.3800	3.596	382.816	
S02 34S	33(10,24) - 34(9,25)		277473.699(3946)	4.3642	4.367	512.811	
S02 34S	38(11,27) - 39(10,30)		277481.566(5572)	4.3540	5.138	661.991	
S02	19(7,13) - 20(6,14)	278250.970(200)	278251.012(68)	4.4093	2.273	195.602	[70A]
S02 V2=1	17(2,16) - 17(1,17)		278754.945(116)	3.9799	5.499	94.502	
S02 34S	32(4,28) - 31(5,27)		278834.559(772)	4.2503	5.429	358.750	
S02 V2=1	9(5, 5) - 10(4, 6)		278849.523(173)	4.5753	0.757	63.042	
S02 34S	17(3,15) - 17(2,16)		279075.301(155)	3.7743	8.724	103.224	
S02 34S	15(1,15) - 14(0,14)		279430.023(138)	3.5904	11.755	65.014	
S02 33S	6(2, 4) - 5(1, 5)		279434.324(633)	4.0139	1.859	10.841	
S02 33S	8(5, 3) - 9(4, 6)		279446.797(5830)	4.6498	0.562	55.532	
S02	49(6,44) - 50(3,47)		279769.059(1510)	5.2545	0.810	839.259	
S02	50(13,37) - 51(12,40)		279926.766(281)	4.3187	7.121	1092.247	
S02 34S	24(4,20) - 24(3,21)		280408.066(357)	3.6537	15.889	209.521	
S02 33S	15(1,15) - 14(0,14)		280554.000(2791)	3.5871	11.702	65.137	
S02 V2=1	25(8,18) - 26(7,19)		280629.422(782)	4.3612	3.263	309.666	
S02	26(4,22) - 26(3,23)	280807.280(200)	280807.215(97)	3.6329	17.956	243.803	[70A]
S02 V2=1	15(3,13) - 15(2,14)		281200.223(89)	3.7595	7.882	83.041	
S02	58(5,53) - 59(4,56)		281362.969(1534)	5.3307	0.790	1148.168	
S02	48(4,44) - 49(3,47)		281401.660(685)	5.4101	0.545	785.260	
S02 V2=1	22(2,20) - 21(3,19)		281511.613(136)	4.0612	5.693	163.380	
S02	36(4,32) - 36(3,33)	281688.980(200)	281689.234(186)	3.5791	27.729	450.799	[70A]
S02	15(1,15) - 14(0,14)	281762.600(200)	281762.598(38)	3.5836	11.646	65.264	[70A]
S02 V2=1	15(1,15) - 14(0,14)		281814.242(99)	3.5878	11.626	65.210	
S02	6(2, 4) - 5(1, 5)	282036.580(100)	282036.559(14)	3.9986	1.873	10.886	[70A]
S02 33S	17(3,15) - 17(2,16)		282271.020(6850)	3.7581	8.751	103.462	
S02	20(1,19) - 20(0,20)	282292.800(100)	282292.797(51)	3.9991	5.884	128.811	[70A]
S02	53(7,47) - 54(4,50)		282331.652(3226)	5.2231	0.916	993.234	
S02	55(14,42) - 56(13,43)		282508.652(425)	4.3030	7.892	1306.939	
S02	24(8,16) - 25(7,19)	282636.240(100)	282636.145(81)	4.3611	3.044	291.259	[70A]
S02 V2=1	16(0,16) - 15(1,15)		282803.473(95)	3.5762	12.578	74.610	
S02 33S	13(6, 8) - 14(5, 9)		283094.129(9558)	4.4717	1.294	108.907	
S02 34S	16(0,16) - 15(1,15)		283183.590(136)	3.5659	12.721	74.335	
S02 33S	16(0,16) - 15(1,15)		283334.867(2924)	3.5672	12.662	74.495	
S02	16(0,16) - 15(1,15)	283464.600(100)	283464.785(36)	3.5687	12.600	74.663	[70A]
S02 33S	20(1,19) - 20(0,20)		283790.789(6105)	3.9997	5.784	128.535	
S02 34S	36(4,32) - 36(3,33)		284657.035(2734)	3.5783	26.925	449.592	
S02 34S	20(1,19) - 20(0,20)		285178.578(352)	4.0003	5.692	128.271	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 34S	38(5,33) - 37(6,32)		285362.164(2059)	4.2432	6.099	509.388	
S02 V2=1	6(2, 4) - 5(1, 5)		285639.699(118)	3.9846	1.878	10.915	
S02	17(3,15) - 17(2,16)	285743.550(100)	285743.566(53)	3.7409	8.777	103.712	[70A]
S02	33(5,29) - 34(2,32)	285768.270(100)	285768.383(230)	5.3342	0.428	393.023	[70A]
S02 V2=1	36(4,32) - 36(3,33)		286094.398(516)	3.5607	27.853	451.001	
S02 V2=1	18(1,17) - 17(2,16)		286339.039(98)	3.8203	7.745	103.800	
S02	22(2,20) - 21(3,19)	286416.320(100)	286416.391(45)	4.0319	5.733	163.122	[70A]
S02 V2=1	20(1,19) - 20(0,20)		286432.613(177)	3.9812	5.920	128.682	
S02 V2=1	14(6, 8) - 15(5,11)		286497.855(293)	4.4250	1.506	120.252	
S02	29(9,21) - 30(8,22)	286651.460(100)	286651.191(95)	4.3252	3.817	406.281	[70A]
S02	9(3, 7) - 10(0,10)		286769.328(22)	6.0842	0.021	34.549	
S02 V2=1	30(9,21) - 31(8,24)		286848.465(1263)	4.3181	4.036	428.408	
S02	43(6,38) - 44(3,41)		287415.367(1019)	5.2517	0.661	659.183	
S02	8(5, 3) - 9(4, 6)	287485.440(100)	287485.621(43)	4.6130	0.562	56.046	[70A]
S02	41(5,37) - 42(2,40)		288117.617(473)	5.2975	0.564	586.013	
S02 V2=1	26(4,22) - 26(3,23)		288378.977(286)	3.6041	17.866	244.017	
S02	18(1,17) - 17(2,16)	288519.960(100)	288520.047(37)	3.8041	7.793	103.712	[70A]
S02 V2=1	38(3,35) - 39(2,38)		289523.113(1199)	5.4958	0.329	490.033	
S02	34(10,24) - 35(9,27)		290338.387(114)	4.2965	4.589	540.651	
S02	25(3,23) - 26(0,26)		290409.574(131)	5.7049	0.132	213.369	
S02 33S	18(1,17) - 17(2,16)		290924.777(3826)	3.7858	7.927	103.462	
S02 34S	7(5, 3) - 8(4, 4)		291146.281(374)	4.7119	0.380	49.309	
S02 V2=1	17(3,15) - 17(2,16)		291752.953(101)	3.7170	8.786	103.800	
S02 34S	9(2, 8) - 8(1, 7)		292257.301(136)	3.8665	3.335	25.432	
S02	51(6,46) - 52(3,49)		292363.074(1681)	5.2117	0.815	903.859	
S02 33S	22(2,20) - 21(3,19)		292538.441(6705)	3.9957	5.850	162.699	
S02	33(4,30) - 34(1,33)		292670.707(158)	5.4156	0.331	377.306	
S02 V2=1	35(10,26) - 36(9,27)		292711.066(1953)	4.2817	4.808	566.558	
S02	13(6, 8) - 14(5, 9)		292882.695(60)	4.4275	1.294	109.730	
S02 34S	18(1,17) - 17(2,16)		293122.953(125)	3.7689	8.059	103.224	
S02 34S	12(6, 6) - 13(5, 9)		293297.547(656)	4.4681	1.086	99.198	
S02	21(4,18) - 22(1,21)		293386.195(92)	5.5081	0.170	165.450	
S02 34S	19(3,17) - 19(2,18)		293481.773(157)	3.7208	9.453	126.368	
S02 V2=1	19(7,13) - 20(6,14)		293608.871(517)	4.3429	2.273	196.918	
S02	39(11,29) - 40(10,30)		293717.777(149)	4.2727	5.361	694.346	
S02 34S	17(7,11) - 18(6,12)		294904.855(1145)	4.3782	1.840	168.328	
S02 33S	9(2, 8) - 8(1, 7)		295321.594(1382)	3.8540	3.326	25.474	
S02	53(7,47) - 52(8,44)		296004.348(182)	4.2125	8.150	992.778	
S02 34S	22(8,14) - 23(7,17)		296046.852(1899)	4.3311	2.607	256.693	
S02	26(2,24) 26(1,25)	296168.710(100)	296168.750(66)	3.7274	12.313	226.817	[70A]
S02 34S	22(4,18) - 22(3,19)		296499.738(218)	3.6101	13.647	178.569	
S02	24(4,20) - 24(3,21)	296535.490(100)	296535.391(92)	3.5917	15.500	210.144	[70A]
S02 34S	27(9,19) - 28(8,20)		296775.137(2966)	4.3026	3.377	364.283	
S02	44(12,32) - 45(11,35)		296806.621(212)	4.2524	6.132	867.341	
S02 34S	32(10,22) - 33(9,25)		297137.414(4395)	4.2842	4.148	491.080	
S02 34S	37(11,27) - 38(10,28)		297164.648(6228)	4.2721	4.920	637.065	
S02	49(6,44) - 48(7,41)		297257.223(167)	4.2405	6.980	838.676	
S02	18(7,11) - 19(6,14)	297782.570(100)	297782.637(76)	4.3417	2.055	182.803	[70A]
S02 V2=1	8(5, 3) - 9(4, 6)		298152.492(189)	4.5693	0.562	56.655	
S02 34S	22(2,20) - 21(3,19)		298256.879(128)	3.9618	5.967	162.303	
S02	9(2, 8) - 8(1, 7)		298576.297(24)	3.8409	3.317	25.518	
S02 33S	7(5, 3) - 8(4, 4)		298687.258(6431)	4.6787	0.380	49.787	
S02	19(3,17) - 19(2,18)		299316.801(62)	3.6910	9.544	126.933	
S02	49(13,37) - 50(12,38)		299615.145(310)	4.2349	6.904	1059.607	
S02 V2=1	26(2,24) - 26(1,25)		299800.387(211)	3.7119	12.408	226.786	
S02 34S	19(2,18) - 19(1,19)		300049.172(285)	3.9291	5.477	116.359	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	32(3,29) - 32(2,30)		300273.637(95)	3.5940	19.697	350.500	
S02 V2=1	24(8,16) - 25(7,19)		300279.750(878)	4.2859	3.044	293.029	
S02 V2=1	9(2, 8) - 8(1, 7)		301673.180(119)	3.8316	3.314	25.552	
S02	19(2,18) - 19(1,19)		301896.598(52)	3.9103	5.613	116.862	
S02	54(14,40) - 55(13,43)		302150.738(460)	4.2197	7.675	1271.111	
S02	23(8,16) - 24(7,17)		302236.156(91)	4.2881	2.825	275.255	
S02	51(7,45) - 52(4,48)		303121.664(2913)	5.1717	0.802	924.807	
S02 34S	26(2,24) - 26(1,25)		303139.707(517)	3.7151	11.815	225.946	
S02 V2=1	32(3,29) - 32(2,30)		303591.688(339)	3.5797	19.869	350.585	
S02 34S	3(3, 1) - 2(2, 0)		304332.105(160)	3.5069	2.490	8.507	
S02	59(15,45) - 60(14,46)		304418.023(691)	4.2044	8.447	1501.819	
S02 V2=1	24(4,20) - 24(3,21)		304474.781(245)	3.5628	15.434	210.371	
S02 V2=1	19(3,17) - 19(2,18)		305401.863(122)	3.6678	9.560	127.003	
S02 V2=1	28(3,25) - 27(4,24)		305455.113(292)	4.0619	5.637	270.138	
S02	43(5,39) - 44(2,42)		305485.234(552)	5.2468	0.557	640.030	
S02 V2=1	13(6, 8) - 14(5, 9)		305903.578(323)	4.3746	1.294	110.665	
S02	31(5,27) - 32(2,30)		306098.332(194)	5.3083	0.348	350.500	
S02	28(9,19) - 29(8,22)		306303.559(107)	4.2495	3.597	387.074	
S02 V2=1	29(9,21) - 30(8,22)		306539.672(1417)	4.2414	3.817	408.569	
S02	7(5, 3) - 8(4, 4)		306738.969(47)	4.6443	0.380	50.295	
S02 V2=1	40(5,35) - 39(6,34)		307068.094(1037)	4.1459	6.498	562.846	
S02	38(4,34) - 38(3,35)		307185.762(235)	3.4911	27.624	499.482	
S02 V2=1	19(2,18) - 19(1,19)		307274.582(159)	3.8891	5.639	116.754	
S02 34S	40(5,35) - 40(4,36)		307368.129(6139)	3.4527	31.686	560.555	
S02	41(6,36) - 42(3,39)		308233.914(864)	5.2106	0.562	603.692	
S02	30(2,28) - 31(1,31)		309547.871(295)	5.7394	0.121	299.932	
S02 34S	32(3,29) - 32(2,30)		309815.570(1559)	3.5742	18.776	349.319	
S02	33(10,24) - 34(9,25)		310016.980(130)	4.2195	4.370	518.242	
S02 34S	6(5, 1) - 7(4, 4)		310341.215(401)	4.8091	0.217	44.208	
S02 34S	38(5,33) - 38(4,34)		310378.410(5300)	3.4520	29.296	508.554	
S02	53(6,48) - 54(3,51)		310854.090(1867)	5.1535	0.806	970.763	
S02 V2=1	38(4,34) - 38(3,35)		311072.535(584)	3.4754	27.820	499.690	
S02 34S	21(3,19) - 21(2,20)		311196.672(162)	3.6610	10.034	151.923	
S02 V2=1	34(4,30) - 33(5,29)		311218.527(585)	4.0998	5.912	403.296	
S02 34S	17(1,17) - 16(0,16)		311485.434(162)	3.4319	13.803	83.781	
S02 34S	20(4,16) - 20(3,17)		311487.434(164)	3.5702	11.757	150.345	
S02	12(6, 6) - 13(5, 9)		312258.535(65)	4.3867	1.086	100.778	
S02 V2=1	34(10,24) - 35(9,27)		312426.164(2186)	4.2046	4.589	543.520	
S02	22(4,18) - 22(3,19)		312542.492(86)	3.5499	13.387	179.191	
S02 34S	11(6, 6) - 12(5, 7)		312603.879(711)	4.4382	0.884	90.902	
S02 V2=1	18(7,11) - 19(6,14)		313125.242(574)	4.2799	2.055	184.128	
S02	3(3, 1) - 2(2, 0)		313279.742(17)	3.4690	2.491	8.747	
S02	38(11,27) - 39(10,30)		313404.000(169)	4.1951	5.142	668.737	
S02	28(3,25) - 27(4,24)		313412.516(65)	4.0220	5.670	269.669	
S02 V2=1	17(1,17) - 16(0,16)		313536.617(107)	3.4312	13.671	84.044	
S02	17(1,17) - 16(0,16)		313660.859(49)	3.4263	13.692	84.118	
S02	35(4,32) - 36(1,35)		313900.383(203)	5.3626	0.321	420.745	
S02 34S	16(7, 9) - 17(6,12)		314321.785(1250)	4.3230	1.627	156.835	
S02	27(3,25) - 28(0,28)		314922.215(177)	5.6539	0.126	246.236	
S02 34S	38(4,34) - 38(3,35)		315191.957(4032)	3.4761	26.473	498.040	
S02	7(3, 5) - 8(0, 8)		315395.250(20)	6.3324	0.007	22.727	
S02 34S	21(8,14) - 22(7,15)		315548.355(2080)	4.2660	2.390	242.001	
S02	21(3,19) - 21(2,20)	316099.010(200)	316098.863(71)	3.6348	10.169	152.579	[70A]
S02 34S	11(2,10) - 10(1, 9)		316339.871(154)	3.7537	4.126	37.920	
S02 34S	26(9,17) - 27(8,20)		316342.723(3261)	4.2323	3.159	346.392	
S02	43(12,32) - 44(11,33)		316481.730(236)	4.1746	5.914	838.536	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 34S	31(10,22) - 32(9,23)		316747.734(4849)	4.2109	3.930	469.992	
S02 34S	36(11,25) - 37(10,28)		316798.445(6895)	4.1968	4.701	612.781	
S02	17(7,11) - 18(6,12)		317250.445(84)	4.2832	1.840	170.647	
S02 V2=1	7(5, 3) - 8(4, 4)		317392.012(204)	4.6035	0.380	50.908	
S02 V2=1	39(11,29) - 40(10,30)		317955.473(3249)	4.1730	5.361	697.857	
S02	52(7,45) - 51(8,44)		318088.332(256)	4.1069	8.218	959.136	
S02	46(6,40) - 45(7,39)		318238.121(174)	4.1050	7.299	747.307	
S02 34S	30(2,28) - 31(1,31)		319051.801(8619)	5.7362	0.111	298.638	
S02 V2=1	3(3, 1) - 2(2, 0)		319136.277(136)	3.4486	2.491	8.903	
S02	48(13,35) - 49(12,38)		319263.008(341)	4.1572	6.686	1027.609	
S02	40(5,35) - 40(4,36)		319277.641(457)	3.4092	31.252	561.844	
S02	42(5,37) - 42(4,38)		319699.465(562)	3.3999	33.367	616.467	
S02 V2=1	23(8,16) - 24(7,17)		319863.988(976)	4.2179	2.825	277.036	
S02	59(8,52) - 58(9,49)		320087.922(277)	4.1028	9.229	1234.621	
S02	19(4,16) - 20(1,19)		320475.605(88)	5.5277	0.113	138.228	
S02 34S	18(0,18) - 17(1,17)		320597.242(163)	3.3882	14.798	94.171	
S02 V2=1	22(4,18) - 22(3,19)		320702.543(207)	3.5214	13.343	179.434	
S02 V2=1	18(0,18) - 17(1,17)		320707.508(107)	3.3955	14.660	94.502	
S02 34S	36(5,31) - 36(4,32)		321283.906(4453)	3.4283	26.444	459.087	
S02	18(0,18) - 17(1,17)		321330.191(49)	3.3886	14.682	94.581	
S02	40(5,35) - 39(6,34)		321420.746(119)	4.0823	6.501	561.772	
S02	53(14,40) - 54(13,41)		321756.434(497)	4.1422	7.458	1235.924	
S02	22(8,14) - 23(7,17)		321782.547(102)	4.2225	2.607	259.895	
S02 V2=1	21(3,19) - 21(2,20)		322293.727(154)	3.6122	10.192	152.630	
S02	58(8,50) - 57(9,49)		322437.961(378)	4.0879	9.184	1197.223	
S02	34(4,30) - 33(5,29)		322475.711(86)	4.0483	5.931	402.555	
S02	11(2,10) - 10(1, 9)		323026.445(33)	3.7305	4.088	38.027	
S02	51(6,46) - 50(7,43)		323094.125(219)	4.1590	6.824	902.834	
S02 V2=1	30(2,28) - 31(1,31)		323351.520(1048)	5.6797	0.123	299.561	
S02	22(1,21) - 22(0,22)		323526.371(69)	3.8652	5.839	154.658	
S02 34S	4(3, 1) - 3(2, 2)		323528.770(161)	3.5188	2.593	10.416	
S02 34S	18(4,14) - 18(3,15)		323806.746(162)	3.5391	10.146	124.864	
S02	58(15,43) - 59(14,46)		323968.094(731)	4.1277	8.230	1463.448	
S02	59(8,52) - 60(5,55)		324790.984(6889)	5.0916	0.906	1234.464	
S02 V2=1	12(6, 6) - 13(5, 9)		325264.914(353)	4.3373	1.086	101.719	
S02	27(9,19) - 28(8,20)		325900.848(121)	4.1805	3.378	368.510	
S02 V2=1	11(2,10) - 10(1, 9)		325921.840(124)	3.7233	4.082	38.058	
S02	6(5, 1) - 7(4, 4)		325960.422(50)	4.7455	0.217	45.185	
S02 34S	22(1,21) - 22(0,22)		325997.445(655)	3.8689	5.660	154.002	
S02 V2=1	28(9,19) - 29(8,22)		326175.211(1574)	4.1713	3.597	389.375	
S02	40(3,37) - 41(2,40)		326410.941(518)	5.4019	0.297	539.568	
S02	20(4,16) - 20(3,17)		326867.480(78)	3.5133	11.599	150.973	
S02 V2=1	40(5,35) - 40(4,36)		327134.141(990)	3.3827	31.144	562.176	
S02	38(5,33) - 38(4,34)		327217.262(365)	3.3946	28.342	509.729	
S02	45(5,41) - 46(2,44)		327761.082(656)	5.1862	0.542	696.368	
S02 V2=1	22(1,21) - 22(0,22)		328421.512(255)	3.8469	5.873	154.495	
S02 34S	5(5, 1) - 6(4, 2)		329499.699(425)	5.0683	0.085	39.747	
S02	32(10,22) - 33(9,25)		329645.688(147)	4.1487	4.150	496.476	
S02	44(5,39) - 44(4,40)		329690.262(681)	3.3638	34.618	673.522	
S02 34S	8(2, 6) - 7(1, 7)		330191.156(144)	3.9260	1.804	18.710	
S02 34S	21(2,20) - 21(1,21)		330667.629(488)	3.8389	5.552	140.893	
S02	11(6, 6) - 12(5, 7)		331580.324(71)	4.3617	0.884	92.468	
S02 34S	10(6, 4) - 11(5, 7)		331867.445(765)	4.4285	0.690	83.247	
S02 V2=1	33(10,24) - 34(9,25)		332087.000(2424)	4.1336	4.370	521.125	
S02	21(2,20) - 21(1,21)		332091.379(67)	3.8218	5.701	141.501	
S02 34S	23(3,21) - 23(2,22)		332173.691(240)	3.5960	10.474	179.871	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	4(3, 1) - 3(2, 2)		332505.266(17)	3.4828	2.595	10.659	
S02 V2=1	17(7,11) - 18(6,12)		332578.141(630)	4.2254	1.840	171.980	
S02 34S	16(4,12) - 16(3,13)		332836.289(159)	3.5195	8.716	102.117	
S02	37(11,27) - 38(10,28)		333043.438(190)	4.1234	4.923	643.771	
S02	59(6,54) - 58(7,51)		333361.090(587)	4.3403	4.731	1187.315	
S02 34S	28(3,25) - 27(4,24)		333363.965(439)	3.9262	5.875	268.321	
S02 34S	15(7, 9) - 16(6,10)		333685.035(1351)	4.2780	1.417	145.983	
S02	55(7,49) - 54(8,46)		333984.895(252)	4.0656	8.256	1061.821	
S02	55(6,50) - 56(3,53)		334276.430(2091)	5.0852	0.787	1039.976	
S02	8(2, 6) - 7(1, 7)		334673.340(20)	3.8961	1.856	18.825	
S02	49(7,43) - 50(4,46)		334765.207(2596)	5.1054	0.667	858.611	
S02 34S	20(8,12) - 21(7,15)		334998.453(2259)	4.2084	2.174	227.952	
S02 V2=1	20(4,16) - 20(3,17)		335128.504(172)	3.4854	11.573	151.232	
S02	29(5,25) - 30(2,28)		335773.195(172)	5.2847	0.261	310.258	
S02 34S	25(9,17) - 26(8,18)		335857.938(3556)	4.1687	2.941	329.144	
S02	50(4,46) - 51(3,49)		335943.016(1067)	5.2278	0.508	847.405	
S02 V2=1	38(5,33) 38(4,34)		336030.641(924)	3.3659	28.392	510.066	
S02	23(3,21) - 23(2,22)		336089.234(81)	3.5733	10.653	180.632	
S02	42(12,30) - 43(11,33)		336114.270(262)	4.1025	5.696	810.373	
S02 34S	30(10,20) - 31(9,23)		336308.762(5307)	4.1437	3.711	449.546	
S02 34S	35(11,25) - 36(10,26)		336385.414(7571)	4.1273	4.482	589.140	
S02 V2=1	6(5, 1) - 7(4, 4)		336599.551(219)	4.7074	0.217	45.802	
S02	16(7, 9) - 17(6,12)		336669.633(92)	4.2337	1.626	159.134	
S02 V2=1	20(1,19) - 19(2,18)		336760.707(123)	3.5559	9.699	127.003	
S02 V2=1	38(11,27) - 39(10,30)		337622.828(3595)	4.1018	5.142	672.265	
S02 34S	34(5,29) - 34(4,30)		337874.457(3583)	3.3890	23.528	412.230	
S02 V2=1	21(2,20) - 21(1,21)		337892.203(221)	3.8009	5.728	141.359	
S02	18(4,14) - 18(3,15)		338305.992(67)	3.4861	10.053	125.498	
S02 34S	13(2,12) - 12(1,11)		338320.438(176)	3.6439	5.100	52.970	
S02 V2=1	4(3, 1) - 3(2, 2)		338348.582(142)	3.4637	2.595	10.814	
S02 V2=1	8(2, 6) - 7(1, 7)		338376.273(134)	3.8833	1.865	18.843	
S02	20(1,19) - 19(2,18)		338611.879(52)	3.5424	9.757	126.933	
S02 34S	14(4,10) - 14(3,11)		338785.758(144)	3.5118	7.394	82.074	
S02	47(13,35) - 48(12,36)		338872.156(374)	4.0849	6.468	996.252	
S02	37(4,34) - 38(1,37)		339148.613(283)	5.3037	0.308	466.519	
S02	39(6,34) - 40(3,37)		339260.586(716)	5.1620	0.449	550.456	
S02 V2=1	22(8,14) - 23(7,17)		339394.559(1074)	4.1567	2.607	261.687	
S02	28(2,26) - 28(1,27)		340316.496(81)	3.5885	12.018	260.960	
S02	21(8,14) - 22(7,15)		341275.457(113)	4.1639	2.389	245.178	
S02	53(6,48) - 52(7,45)		341323.633(286)	4.1248	6.506	969.746	
S02	52(14,38) - 53(13,41)		341327.344(538)	4.0699	7.240	1201.378	
S02	40(4,36) - 40(3,37)		341403.691(300)	3.3856	26.984	550.456	
S02	36(5,31) - 36(4,32)		341674.293(287)	3.3621	25.610	460.196	
S02 34S	5(3, 3) - 4(2, 2)		342208.934(160)	3.5086	2.742	12.979	
S02 34S	20(1,19) - 19(2,18)		342231.668(143)	3.5146	10.077	126.368	
S02 34S	12(4, 8) - 12(3, 9)		342332.098(126)	3.5150	6.133	64.696	
S02 V2=1	23(3,21) - 23(2,22)		342435.883(197)	3.5514	10.685	180.661	
S02	29(3,27) - 30(0,30)		342634.176(247)	5.6000	0.119	281.446	
S02	34(3,31) - 34(2,32)		342761.934(117)	3.4626	19.024	393.023	
S02	57(15,43) - 58(14,44)		343487.156(776)	4.0560	8.013	1425.717	
S02 V2=1	24(2,22) - 23(3,21)		343923.816(192)	3.7440	7.057	192.083	
S02 34S	10(4, 6) - 10(3, 7)		344245.445(124)	3.5294	4.901	49.947	
S02 V2=1	11(6, 6) - 12(5, 7)		344572.438(381)	4.3154	0.884	93.414	
S02 34S	19(1,19) - 18(0,18)		344581.117(185)	3.2872	15.850	104.865	
S02 V2=1	28(2,26) - 28(1,27)		344613.570(305)	3.5728	12.103	260.907	
S02 34S	13(4,10) - 13(3,11)		344807.988(133)	3.4989	6.726	72.916	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 V2=1	40(4,36) - 40(3,37)		344972.238(683)	3.3720	27.223	550.669	
S02 34S	15(4,12) - 15(3,13)		344987.648(151)	3.4853	7.956	91.449	
S02 34S	11(4, 8) - 11(3, 9)		344998.246(122)	3.5156	5.505	56.942	
S02	5(5, 1) - 6(4, 2)		345149.094(52)	5.0083	0.085	40.715	
S02 34S	8(4, 4) - 8(3, 5)		345168.781(146)	3.5601	3.667	37.795	
S02 34S	9(4, 6) - 9(3, 7)		345285.727(133)	3.5404	4.284	43.531	
S02	13(2,12) - 12(1,11)		345338.520(44)	3.6233	5.028	53.108	
S02	26(9,17) - 27(8,20)		345448.785(136)	4.1176	3.159	350.590	
S02 34S	7(4, 4) - 7(3, 5)		345519.781(163)	3.5866	3.035	32.683	
S02 34S	6(4, 2) - 6(3, 3)		345553.223(181)	3.6297	2.381	28.220	
S02 34S	5(4, 2) - 5(3, 3)		345651.434(199)	3.7067	1.686	24.394	
S02 34S	4(4, 0) - 4(3, 1)		345678.934(215)	3.8841	0.917	21.207	
S02 V2=1	27(9,19) - 28(8,20)		345755.875(1734)	4.1071	3.378	370.824	
S02 34S	17(4,14) - 17(3,15)		345929.352(160)	3.4718	9.190	112.533	
S02 V2=1	34(3,31) - 34(2,32)		346364.840(439)	3.4490	19.190	393.100	
S02 V2=1	19(1,19) - 18(0,18)		346379.242(122)	3.2877	15.720	105.200	
S02	16(4,12) - 16(3,13)		346523.891(55)	3.4699	8.660	102.750	
S02 V2=1	18(4,14) - 18(3,15)		346591.758(142)	3.4589	10.037	125.774	
S02	19(1,19) - 18(0,18)		346652.195(61)	3.2824	15.741	105.299	
S02 34S	28(2,26) - 28(1,27)		347482.758(1112)	3.5777	11.576	259.927	
S02	57(6,52) - 56(7,49)		347829.797(475)	4.2113	5.415	1111.967	
S02 V2=1	13(2,12) - 12(1,11)		347991.758(128)	3.6181	5.016	53.136	
S02 34S	19(4,16) - 19(3,17)		348117.555(157)	3.4564	10.412	136.157	
S02	24(2,22) - 23(3,21)		348387.953(62)	3.7199	7.115	191.842	
S02	5(3, 3) - 6(0, 6)		348633.379(20)	6.7783	0.001	13.313	
S02	31(10,22) - 32(9,23)		349226.824(165)	4.0836	3.931	475.353	
S02	46(5,41) - 46(4,42)		349784.516(817)	3.3018	34.941	732.936	
S02	55(6,50) - 54(7,47)		350110.758(372)	4.1409	6.026	1039.448	
S02	10(6, 4) - 11(5, 7)		350862.879(76)	4.3563	0.690	84.799	
S02	5(3, 3) - 4(2, 2)		351257.242(18)	3.4740	2.745	13.226	
S02 V2=1	36(5,31) - 36(4,32)		351288.773(834)	3.3322	25.459	460.544	
S02 V2=1	32(10,22) - 33(9,25)		351698.066(2667)	4.0680	4.150	499.374	
S02	14(4,10) - 14(3,11)		351873.895(43)	3.4645	7.359	82.698	
S02 V2=1	16(7, 9) - 17(6,12)		351982.363(685)	4.1795	1.626	160.475	
S02	36(11,25) - 37(10,28)		352639.004(212)	4.0569	4.704	619.448	
S02	47(5,43) - 48(2,46)		354084.141(812)	5.1199	0.523	755.032	
S02 V2=1	16(4,12) - 16(3,13)		354799.957(120)	3.4433	8.651	103.042	
S02	12(4, 8) - 12(3, 9)		355045.551(31)	3.4690	6.111	65.306	
S02	32(2,30) - 33(1,33)		355153.582(429)	5.6255	0.111	338.653	
S02	17(4,14) - 18(1,17)		355186.426(81)	5.5811	0.066	113.336	
S02	41(12,30) - 42(11,31)		355706.301(289)	4.0353	5.477	782.852	
S02 V2=1	5(5, 1) - 6(4, 2)		355774.410(232)	4.9725	0.085	41.335	
S02	15(7, 9) - 16(6,10)		356040.699(101)	4.1937	1.416	148.263	
S02	10(4, 6) - 10(3, 7)		356755.234(23)	3.4841	4.888	50.538	
S02 V2=1	5(3, 3) - 4(2, 2)		357087.047(147)	3.4562	2.746	13.379	
S02	13(4,10) - 13(3,11)	357165.360(200)	357165.414(37)	3.4545	6.704	73.551	[70A]
S02	15(4,12) - 15(3,13)	357241.190(200)	357241.207(50)	3.4414	7.928	92.118	[70A]
S02 V2=1	37(11,27) - 38(10,28)		357243.598(3947)	4.0337	4.923	647.316	
S02	11(4, 8) - 11(3, 9)	357387.570(200)	357387.617(27)	3.4708	5.490	57.549	[70A]
S02	8(4, 4) - 8(3, 5)		357581.504(19)	3.5149	3.660	38.368	
S02 V2=1	20(0,20) - 19(1,19)		357602.676(128)	3.2410	16.724	116.754	
S02	9(4, 6) - 9(3, 7)	357671.780(200)	357671.871(20)	3.4955	4.275	44.115	[70A]
S02	7(4, 4) - 7(3, 5)		357892.504(20)	3.5415	3.030	33.247	
S02	6(4, 2) - 6(3, 3)	357925.960(200)	357925.910(21)	3.5845	2.378	28.776	[70A]
S02	17(4,14) - 17(3,15)	357962.890(200)	357962.906(64)	3.4288	9.158	113.244	[70A]
S02	5(4, 2) - 5(3, 3)	358013.090(200)	358013.223(23)	3.6615	1.684	24.943	[70A]

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	4(4, 0) - 4(3, 1)	358038.080(200)	358037.957(25)	3.8388	0.916	21.750	[70A]
S02	20(0,20) - 19(1,19)	358215.640(200)	358215.680(64)	3.2345	16.744	116.862	[70A]
S02	46(13,33) - 47(12,36)		358444.461(408)	4.0174	6.249	965.537	
S02 V2=1	21(8,14) - 22(7,15)		358871.840(1172)	4.1021	2.389	246.980	
S02	25(3,23) - 25(2,24)		359151.184(90)	3.5079	11.012	211.076	
S02	19(4,16) - 19(3,17)		359770.680(77)	3.4147	10.383	136.917	
S02 V2=1	14(4,10) - 14(3,11)		360132.996(110)	3.4383	7.353	83.005	
S02	34(5,29) - 34(4,30)		360290.648(225)	3.3191	22.797	413.312	
S02	20(8,12) - 21(7,15)		360721.762(125)	4.1122	2.174	231.104	
S02	51(14,38) - 52(13,39)		360864.996(580)	4.0024	7.022	1167.473	
S02	57(6,52) - 58(3,55)		361724.141(2389)	5.0116	0.762	1111.503	
S02	56(15,41) - 57(14,44)		362976.516(825)	3.9888	7.795	1388.626	
S02	21(4,18) - 21(3,19)		363159.258(89)	3.3976	11.578	163.122	
S02 V2=1	12(4, 8) - 12(3, 9)		363291.660(113)	3.4431	6.107	65.625	
S02 V2=1	10(6, 4) - 11(5, 7)		363840.711(408)	4.3127	0.689	85.750	
S02	24(1,23) - 24(0,24)		363890.793(92)	3.7500	5.826	182.843	
S02	23(2,22) - 23(1,23)		363925.742(85)	3.7371	5.755	168.492	
S02	25(9,17) - 26(8,18)		364949.883(151)	4.0605	2.941	333.313	
S02 V2=1	10(4, 6) - 10(3, 7)		364993.930(123)	3.4582	4.885	50.867	
S02 V2=1	26(9,17) - 27(8,20)		365287.277(1894)	4.0486	3.159	352.915	
S02 V2=1	13(4,10) - 13(3,11)		365386.824(110)	3.4288	6.700	73.866	
S02 V2=1	15(4,12) - 15(3,13)		365447.590(112)	3.4158	7.923	92.420	
S02 V2=1	11(4, 8) - 11(3, 9)		365616.910(117)	3.4451	5.487	57.875	
S02 V2=1	25(3,23) - 25(2,24)		365698.801(255)	3.4866	11.052	211.080	
S02 V2=1	8(4, 4) - 8(3, 5)		365816.602(136)	3.4891	3.658	38.706	
S02 V2=1	9(4, 6) - 9(3, 7)		365904.359(129)	3.4697	4.273	44.449	
S02 V2=1	7(4, 4) - 7(3, 5)		366125.660(143)	3.5156	3.029	33.589	
S02 V2=1	17(4,14) - 17(3,15)		366145.102(126)	3.4033	9.152	113.532	
S02 V2=1	6(4, 2) - 6(3, 3)		366159.344(149)	3.5587	2.377	29.121	
S02	15(2,14) - 14(1,13)		366214.449(56)	3.5171	6.182	70.722	
S02 V2=1	5(4, 2) - 5(3, 3)		366246.039(155)	3.6356	1.683	25.290	
S02 V2=1	4(4, 0) - 4(3, 1)		366270.543(160)	3.8129	0.915	22.100	
S02	39(4,36) - 40(1,39)		367658.063(420)	5.2423	0.293	514.629	
S02 V2=1	19(4,16) - 19(3,17)		367918.809(152)	3.3895	10.377	137.190	
S02	57(7,51) - 56(8,48)		368331.215(349)	3.9533	8.257	1133.546	
S02	57(8,50) - 58(5,53)		368487.023(6340)	5.0015	0.738	1157.553	
S02 V2=1	15(2,14) - 14(1,13)		368581.418(135)	3.5138	6.161	70.746	
S02	23(4,20) - 23(3,21)		368629.945(99)	3.3761	12.714	191.842	
S02	30(10,20) - 31(9,23)		368763.852(184)	4.0236	3.712	454.874	
S02 V2=1	24(1,23) - 24(0,24)		369561.152(356)	3.7311	5.859	182.641	
S02	9(6, 4) - 10(5, 5)		370108.754(82)	4.3774	0.506	77.771	
S02 V2=1	23(2,22) - 23(1,23)		370193.559(305)	3.7164	5.784	168.312	
S02 V2=1	34(5,29) - 34(4,30)		370497.195(732)	3.2887	22.671	413.677	
S02 V2=1	32(2,30) - 33(1,33)		370586.684(1356)	5.5675	0.112	338.224	
S02	6(3, 3) - 5(2, 4)		371172.469(19)	3.4503	2.904	16.395	
S02 V2=1	31(10,22) - 32(9,23)		371261.730(2913)	4.0075	3.931	478.265	
S02 V2=1	21(4,18) - 21(3,19)		371264.863(189)	3.3727	11.574	163.380	
S02 V2=1	15(7, 9) - 16(6,10)		371338.617(739)	4.1426	1.416	149.612	
S02	35(11,25) - 36(10,26)		372193.004(235)	3.9953	4.484	595.768	
S02	31(3,29) - 32(0,32)		372892.711(353)	5.5454	0.111	318.997	
S02	27(5,23) - 28(2,26)		374478.641(162)	5.2753	0.179	272.311	
S02	42(3,39) - 43(2,42)		375176.211(794)	5.2724	0.277	591.178	
S02	40(12,28) - 41(11,31)		375259.984(318)	3.9728	5.257	755.974	
S02	14(7, 7) - 15(6,10)		375371.207(109)	4.1641	1.211	138.034	
S02 V2=1	30(3,27) - 29(4,26)		375502.961(417)	3.7512	6.639	306.721	
S02	25(4,22) - 25(3,23)		376641.117(108)	3.3493	13.759	223.056	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 V2=1	23(4,20) - 23(3,21)		376688.641(234)	3.3516	12.714	192.083	
S02 V2=1	36(11,25) - 37(10,28)		376820.652(4307)	3.9742	4.704	623.009	
S02 V2=1	6(3, 3) - 5(2, 4)		376989.555(151)	3.4336	2.905	16.546	
S02	47(7,41) - 48(4,44)		377489.395(2275)	5.0355	0.524	794.646	
S02	50(6,44) - 50(5,45)		377501.902(1692)	3.1879	39.239	872.576	
S02	45(13,33) - 46(12,34)		377981.672(443)	3.9543	6.030	935.464	
S02 V2=1	20(8,12) - 21(7,15)		378302.574(1269)	4.0539	2.173	232.915	
S02	60(8,52) - 59(9,51)		379030.191(577)	3.8795	9.449	1272.508	
S02	48(5,43) - 48(4,44)		379782.500(977)	3.2184	34.494	794.646	
S02 V2=1	21(1,21) - 20(0,20)		380036.930(147)	3.1562	17.763	128.682	
S02	19(8,12) - 20(7,13)		380124.340(137)	4.0672	1.960	217.673	
S02	52(6,46) - 52(5,47)		380160.098(1946)	3.1749	41.155	940.307	
S02	50(14,36) - 51(13,39)		380370.902(624)	3.9390	6.803	1134.208	
S02	54(7,47) - 53(8,46)		380384.398(390)	3.8758	8.493	1026.759	
S02	21(1,21) - 20(0,20)		380433.738(75)	3.1507	17.783	128.811	
S02	37(6,32) - 38(3,35)		380466.980(582)	5.1171	0.335	499.482	
S02	32(5,27) - 32(4,28)		380491.492(181)	3.2724	20.302	369.135	
S02	55(15,41) - 56(14,42)		382437.445(877)	3.9255	7.576	1352.174	
S02	42(4,38) - 42(3,39)		382974.055(385)	3.2709	26.124	603.692	
S02	30(3,27) - 29(4,26)		383018.176(83)	3.7181	6.692	306.272	
S02 V2=1	9(6, 4) - 10(5, 5)		383072.406(434)	4.3363	0.506	78.727	
S02	49(5,45) - 50(2,48)		383652.496(1060)	5.0515	0.502	816.023	
S02 V2=1	22(1,21) - 21(2,20)		384339.777(162)	3.3390	11.800	152.630	
S02	24(9,15) - 25(8,18)		384408.227(167)	4.0088	2.723	316.678	
S02	48(6,42) - 48(5,43)		384444.504(1451)	3.1774	36.557	807.314	
S02 V2=1	25(4,22) - 25(3,23)		384655.324(289)	3.3253	13.766	223.279	
S02 V2=1	25(9,17) - 26(8,18)		384771.992(2055)	3.9952	2.941	335.650	
S02	3(3, 1) - 4(0, 4)		384836.527(23)	7.7080	0.000	6.360	
S02	30(2,28) - 30(1,29)		384935.480(99)	3.4635	11.850	297.418	
S02	27(3,25) - 27(2,26)		385028.605(101)	3.4402	11.265	243.898	
S02 V2=1	36(4,32) - 35(5,31)		385093.828(823)	3.7986	6.605	447.699	
S02	22(1,21) - 21(2,20)		385871.926(69)	3.3277	11.864	152.579	
S02	17(2,16) - 16(1,15)		386604.477(68)	3.4103	7.586	90.817	
S02	48(6,42) - 47(7,41)		386737.605(256)	3.8500	7.632	807.238	
S02	52(4,48) - 53(3,51)		387504.496(1592)	5.0850	0.478	911.882	
S02	27(4,24) - 27(3,25)		387564.598(117)	3.3166	14.683	256.741	
S02	29(10,20) - 30(9,21)		388259.383(204)	3.9683	3.493	435.037	
S02	7(3, 5) - 6(2, 4)		388322.824(22)	3.4270	3.087	20.294	
S02 V2=1	17(2,16) - 16(1,15)		388639.168(145)	3.4090	7.554	90.837	
S02	36(3,33) - 36(2,34)		388912.488(150)	3.3352	18.476	437.827	
S02	8(6, 2) - 9(5, 5)		389325.160(87)	4.4388	0.338	71.383	
S02 V2=1	30(2,28) - 30(1,29)		390028.426(425)	3.4474	11.926	297.337	
S02 V2=1	14(7, 7) - 15(6,10)		390654.359(791)	4.1158	1.210	139.390	
S02 V2=1	30(10,20) - 31(9,23)		390781.414(3162)	3.9517	3.712	457.800	
S02 V2=1	32(5,27) - 32(4,28)		391066.199(631)	3.2423	20.211	369.522	
S02	34(11,23) - 35(10,26)		391707.969(260)	3.9381	4.265	572.731	
S02 V2=1	27(3,25) - 27(2,26)		391832.039(331)	3.4193	11.312	243.874	
S02	59(6,54) - 60(3,57)		392367.309(2814)	4.9364	0.734	1185.347	
S02 V2=1	36(3,33) - 36(2,34)		393052.988(570)	3.3217	18.626	437.890	
S02	54(6,48) - 54(5,49)		393399.137(2221)	3.1367	42.093	1010.427	
S02 V2=1	22(0,22) - 21(1,21)		393810.473(160)	3.1056	18.771	141.359	
S02 V2=1	7(3, 5) - 6(2, 4)		394125.172(154)	3.4112	3.088	20.442	
S02	22(0,22) - 21(1,21)		394436.930(79)	3.0994	18.791	141.501	
S02	42(5,37) - 41(6,36)		394439.605(165)	3.8059	6.976	613.974	
S02	10(2, 8) - 9(1, 9)		394581.922(29)	3.8188	1.671	29.185	
S02	13(7, 7) - 14(6, 8)		394664.770(118)	4.1463	1.010	128.446	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	39(12,28) - 40(11,29)		394777.316(348)	3.9144	5.038	729.738	
S02 V2=1	27(4,24) - 27(3,25)		395545.973(353)	3.2932	14.700	256.945	
S02	36(4,32) - 35(5,31)		396079.816(110)	3.7557	6.642	446.984	
S02	15(4,12) - 16(1,15)		396264.648(71)	5.6811	0.033	90.817	
S02 V2=1	35(11,25) - 36(10,26)		396356.309(4670)	3.9170	4.484	599.344	
S02	25(2,24) - 25(1,25)		397009.730(109)	3.6566	5.790	197.833	
S02	44(13,31) - 45(12,34)		397485.516(481)	3.8952	5.811	906.032	
S02	59(7,53) - 58(8,50)		397571.824(478)	3.8755	8.129	1207.978	
S02 V2=1	19(8,12) - 20(7,13)		397689.703(1365)	4.0121	1.959	219.493	
S02 V2=1	10(2, 8) - 9(1, 9)		398438.563(149)	3.8063	1.685	29.190	
S02	41(4,38) - 42(1,41)		398730.551(636)	5.1806	0.278	565.074	
S02	34(2,32) - 35(1,35)		398913.117(627)	5.5326	0.103	379.717	
S02	46(6,40) - 46(5,41)		399301.285(1221)	3.1480	33.473	744.603	
S02	18(8,10) - 19(7,13)		399487.848(150)	4.0292	1.748	204.883	
S02	49(14,36) - 50(13,37)		399846.516(670)	3.8795	6.584	1101.584	
S02	30(5,25) - 30(4,26)		399914.770(152)	3.2280	18.176	327.708	
S02	29(4,26) - 29(3,27)		401652.836(129)	3.2779	15.469	292.875	
S02	54(15,39) - 55(14,42)		401871.188(933)	3.8660	7.358	1316.362	
S02 V2=1	8(6, 2) - 9(5, 5)		402274.691(458)	4.3999	0.338	72.344	
S02	26(1,25) - 26(0,26)		403152.906(122)	3.6505	5.827	213.369	
S02	59(16,44) 60(15,45)		403568.133(1300)	3.8583	8.096	1550.330	
S02 V2=1	25(2,24) - 25(1,25)		403784.121(413)	3.6360	5.820	197.612	
S02	23(9,15) - 24(8,16)		403826.793(184)	3.9624	2.507	300.686	
S02 V2=1	24(9,15) - 25(8,18)		404214.055(2215)	3.9470	2.723	319.027	
S02 V2=1	26(2,24) - 25(3,23)		404959.039(268)	3.4743	8.700	223.279	
S02	33(3,31) - 34(0,34)		405106.012(514)	5.4917	0.105	358.891	
S02	19(2,18) - 18(1,17)		407605.996(81)	3.3026	9.243	113.336	
S02	28(10,18) - 29(9,21)		407716.344(225)	3.9177	3.275	415.843	
S02	7(6, 2) - 8(5, 3)		408516.766(91)	4.5713	0.190	65.635	
S02	26(2,24) - 25(3,23)		408912.086(80)	3.4540	8.778	223.056	
S02 V2=1	19(2,18) - 18(1,17)		409267.348(163)	3.3030	9.200	113.352	
S02 V2=1	26(1,25) - 26(0,26)		409589.367(480)	3.6312	5.859	213.124	
S02 V2=1	29(4,26) - 29(3,27)		409624.055(428)	3.2552	15.497	293.058	
S02 V2=1	13(7, 7) - 14(6, 8)		409933.258(842)	4.1006	1.010	129.809	
S02 V2=1	29(10,20) - 30(9,21)		410259.754(3411)	3.9002	3.493	437.976	
S02	8(3, 5) - 7(2, 6)		410608.223(25)	3.3896	3.226	24.671	
S02 V2=1	30(5,25) - 30(4,26)		410661.285(538)	3.1985	18.115	328.121	
S02	33(11,23) - 34(10,24)		411186.164(286)	3.8850	4.046	550.336	
S02	29(3,27) - 29(2,28)		413375.184(114)	3.3715	11.438	279.086	
S02	12(7, 5) - 13(6, 8)		413926.430(126)	4.1430	0.817	119.500	
S02 V2=1	23(1,23) - 22(0,22)		414241.563(184)	3.0355	19.797	154.495	
S02	38(12,26) - 39(11,29)		414260.289(379)	3.8598	4.818	704.144	
S02	23(1,23) - 22(0,22)		414742.555(89)	3.0298	19.816	154.658	
S02	51(5,47) - 52(2,50)		415740.801(1439)	4.9834	0.480	879.341	
S02 V2=1	34(11,23) - 35(10,26)		415853.086(5038)	3.8639	4.265	576.322	
S02 V2=1	34(2,32) - 35(1,35)		415973.141(1713)	5.4756	0.104	379.225	
S02 V2=1	8(3, 5) - 7(2, 6)		416399.215(158)	3.3746	3.229	24.816	
S02	28(5,23) - 28(4,24)		416825.668(135)	3.1903	16.360	289.053	
S02	43(13,31) - 44(12,32)		416957.664(519)	3.8398	5.592	877.241	
S02 V2=1	18(8,10) - 19(7,13)		417037.855(1459)	3.9769	1.748	206.712	
S02	56(6,50) - 56(5,51)		417454.496(2527)	3.0752	42.073	1082.861	
S02	50(5,45) - 50(4,46)		418673.609(1173)	3.1205	33.586	858.611	
S02	17(8,10) - 18(7,11)		418815.738(162)	3.9986	1.540	192.736	
S02	31(4,28) - 31(3,29)		419019.250(148)	3.2337	16.106	331.436	
S02	48(14,34) - 49(13,37)		419293.254(718)	3.8235	6.365	1069.601	
S02	44(6,38) - 44(5,39)		419770.523(1004)	3.1060	30.370	684.519	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 V2=1	29(3,27) - 29(2,28)		420492.539(427)	3.3511	11.490	279.032	
S02 V2=1	39(12,28) - 40(11,29)		421013.836(7197)	3.8343	5.037	734.041	
S02	25(5,21) - 26(2,24)		421207.531(158)	5.2896	0.113	236.696	
S02	53(15,39) - 54(14,40)		421278.953(992)	3.8097	7.139	1281.190	
S02	44(3,41) - 45(2,44)		421448.730(1182)	5.1681	0.260	645.125	
S02 V2=1	7(6, 2) - 8(5, 3)		421452.262(480)	4.5345	0.190	66.600	
S02	58(16,42) - 59(15,45)		422924.344(1366)	3.8013	7.883	1511.973	
S02	22(9,13) - 23(8,16)		423208.930(201)	3.9213	2.293	285.336	
S02	9(3, 7) - 8(2, 6)		423513.699(30)	3.3698	3.439	29.988	
S02 V2=1	23(9,15) - 24(8,16)		423616.461(2374)	3.9038	2.507	303.045	
S02	55(8,48) - 56(5,51)		423756.441(5758)	4.9140	0.573	1082.861	
S02 V2=1	31(4,28) - 31(3,29)		427014.902(516)	3.2117	16.147	331.597	
S02	27(10,18) - 28(9,19)		427137.320(247)	3.8714	3.057	397.291	
S02 V2=1	28(5,23) - 28(4,24)		427605.828(456)	3.1617	16.321	289.493	
S02	6(6, 0) - 7(5, 3)		427688.555(95)	4.8684	0.072	60.527	
S02	32(2,30) - 32(1,31)		428768.125(123)	3.3536	11.770	336.198	
S02 V2=1	24(1,23) - 23(2,22)		428939.457(217)	3.1598	13.964	180.661	
S02 V2=1	12(7, 5) - 13(6, 8)		429180.332(890)	4.0996	0.817	120.868	
S02 V2=1	9(3, 7) - 8(2, 6)		429285.047(159)	3.3556	3.441	30.130	
S02 V2=1	24(0,24) - 23(1,23)		429571.863(206)	2.9847	20.806	168.312	
S02 V2=1	28(10,18) - 29(9,21)		429699.652(3660)	3.8530	3.275	418.795	
S02	44(4,40) - 44(3,41)		429864.887(499)	3.1542	25.308	659.183	
S02	24(1,23) - 23(2,22)		430193.816(88)	3.1502	14.030	180.632	
S02	24(0,24) - 23(1,23)		430228.766(95)	2.9786	20.825	168.492	
S02	21(2,20) - 20(1,19)		430232.320(93)	3.1944	11.117	138.228	
S02	26(5,21) - 26(4,22)		430347.645(123)	3.1617	14.763	253.170	
S02	32(11,21) - 33(10,24)		430629.879(313)	3.8358	3.827	528.583	
S02	45(7,39) - 46(4,42)		430847.684(1956)	4.9730	0.390	732.936	
S02	27(2,26) - 27(1,27)		431001.551(142)	3.5807	5.812	229.521	
S02	35(6,30) - 36(3,33)		431127.246(464)	5.0860	0.234	450.799	
S02 V2=1	21(2,20) - 20(1,19)		431496.520(190)	3.1964	11.064	138.236	
S02	43(4,40) - 44(1,43)		431745.559(955)	5.1204	0.264	617.856	
S02	11(7, 5) - 12(6, 6)		433160.176(134)	4.1586	0.633	111.194	
S02	37(12,26) - 38(11,27)		433710.801(412)	3.8089	4.599	679.191	
S02	4(4, 0) - 3(3, 1)		434585.148(25)	3.0051	3.491	19.197	
S02 V2=1	32(2,30) - 32(1,31)		434729.074(572)	3.3367	11.840	336.084	
S02	60(7,53) - 60(6,54)		434993.453(4590)	3.0015	47.189	1250.973	
S02 V2=1	33(11,23) - 34(10,24)		435313.250(5408)	3.8144	4.045	553.941	
S02	54(4,50) - 55(3,53)		436046.059(2291)	4.9711	0.453	978.689	
S02 V2=1	17(8,10) - 18(7,11)		436350.496(1551)	3.9488	1.540	194.573	
S02	42(13,29) - 43(12,32)		436399.734(560)	3.7877	5.372	849.092	
S02	38(3,35) - 38(2,36)		436578.898(200)	3.2165	18.107	484.919	
S02	16(8, 8) - 17(7,11)		438111.766(175)	3.9761	1.336	181.229	
S02 V2=1	27(2,26) - 27(1,27)		438316.266(545)	3.5602	5.843	229.254	
S02	47(14,34) - 48(13,35)		438712.508(768)	3.7707	6.145	1038.258	
S02	35(3,33) - 36(0,36)		438761.191(748)	5.4400	0.098	401.126	
S02	33(4,30) - 33(3,31)		439632.781(178)	3.1847	16.601	372.404	
S02	24(5,19) - 24(4,20)		440412.715(113)	3.1427	13.305	220.036	
S02 V2=1	38(12,26) - 39(11,29)		440477.762(7721)	3.7836	4.818	708.463	
S02	58(7,51) - 58(6,52)		440489.262(4124)	2.9951	44.599	1172.622	
S02 V2=1	6(6, 0) - 7(5, 3)		440610.090(500)	4.8333	0.072	61.495	
S02	52(15,37) - 53(14,40)		440661.922(1052)	3.7566	6.919	1246.657	
S02	36(2,34) - 37(1,37)		440850.430(907)	5.4562	0.096	423.122	
S02 V2=1	26(5,21) - 26(4,22)		441089.254(382)	3.1340	14.737	253.636	
S02	28(1,27) - 28(0,28)		441395.711(163)	3.5637	5.832	246.236	
S02 V2=1	38(3,35) - 38(2,36)		441480.871(736)	3.2026	18.240	484.964	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_-)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	13(4,10) - 14(1,13)		441996.785(58)	5.8376	0.015	70.722	
S02	57(16,42) - 58(15,43)		442258.488(1437)	3.7474	7.669	1474.255	
S02	21(9,13) - 22(8,14)		442557.582(218)	3.8855	2.080	270.628	
S02 V2=1	4(4, 0) - 3(3, 1)		442764.008(189)	2.9845	3.491	19.549	
S02 V2=1	22(9,13) - 23(8,16)		442982.555(2530)	3.8655	2.293	287.706	
S02	42(6,36) - 42(5,37)		443180.098(806)	3.0580	27.529	627.131	
S02	31(3,29) - 31(2,30)		443791.793(132)	3.3033	11.551	316.632	
S02 V2=1	32(3,29) - 31(4,28)		445836.664(568)	3.4799	7.895	345.840	
S02	26(10,16) - 27(9,19)		446524.918(270)	3.8293	2.841	379.381	
S02	22(5,17) - 22(4,18)		447487.344(102)	3.1321	11.934	189.617	
S02 V2=1	33(4,30) - 33(3,31)		447699.219(621)	3.1634	16.654	372.541	
S02 V2=1	11(7, 5) - 12(6, 6)		448399.586(935)	4.1173	0.633	112.568	
S02 V2=1	28(1,27) - 28(0,28)		448574.965(627)	3.5440	5.864	245.944	
S02 V2=1	25(1,25) - 24(0,24)		448793.379(237)	2.9243	21.824	182.641	
S02	56(7,49) - 55(8,48)		448796.039(579)	3.6617	8.776	1096.996	
S02 V2=1	27(10,18) - 28(9,19)		449103.703(3908)	3.8098	3.057	400.255	
S02	25(1,25) - 24(0,24)		449384.289(104)	2.9185	21.843	182.843	
S02	53(5,49) - 54(2,52)		449714.109(1988)	4.9175	0.458	944.988	
S02	31(11,21) - 32(10,22)		450041.266(341)	3.7903	3.609	507.472	
S02 V2=1	24(5,19) - 24(4,20)		451095.141(315)	3.1157	13.287	220.527	
S02 V2=1	31(3,29) - 31(2,30)		451281.484(548)	3.2831	11.607	316.544	
S02	10(3, 7) - 9(2, 8)		451490.383(36)	3.3225	3.498	35.478	
S02	58(6,52) - 58(5,53)		451759.664(2886)	2.9952	41.325	1157.553	
S02	20(5,15) - 20(4,16)		452247.785(89)	3.1285	10.622	161.877	
S02	10(7, 3) - 11(6, 6)		452370.051(142)	4.2005	0.461	103.528	
S02	32(3,29) - 31(4,28)		452787.293(104)	3.4517	7.972	345.412	
S02	36(12,24) - 37(11,27)		453130.703(447)	3.7613	4.380	654.880	
S02	25(5,21) - 25(4,22)		453478.496(122)	3.1052	13.827	235.619	
S02	27(5,23) - 27(4,24)		453704.035(134)	3.0982	15.133	269.669	
S02	5(4, 2) - 4(3, 1)		453717.133(24)	3.0261	3.573	21.750	
S02	23(5,19) - 23(4,20)		454098.203(111)	3.1110	12.523	204.139	
S02 V2=1	32(11,21) - 33(10,24)		454739.078(5778)	3.7685	3.827	532.203	
S02	56(7,49) - 56(6,50)		455097.984(3659)	2.9694	41.441	1096.786	
S02	23(2,22) - 22(1,21)		455141.922(106)	3.0873	13.136	165.450	
S02	21(5,17) - 21(4,18)		455159.629(98)	3.1165	11.234	175.236	
S02	29(5,25) - 29(4,26)		455247.281(149)	3.0888	16.421	306.272	
S02	18(5,13) - 18(4,14)		455348.285(74)	3.1304	9.351	136.782	
S02 V2=1	16(8, 8) - 17(7,11)		455631.371(1639)	3.9287	1.336	183.074	
S02	11(3, 9) - 10(2, 8)		455768.563(43)	3.3152	3.787	42.347	
S02	41(13,29) - 42(12,30)		455813.313(601)	3.7388	5.152	821.584	
S02 V2=1	23(2,22) - 22(1,21)		456013.609(229)	3.0904	13.077	165.450	
S02	19(5,15) - 19(4,16)		456352.367(83)	3.1227	9.967	148.917	
S02 V2=1	10(3, 7) - 9(2, 8)		457254.617(162)	3.3090	3.504	35.615	
S02	16(5,11) - 16(4,12)		457315.559(58)	3.1369	8.109	114.309	
S02	15(8, 8) - 16(7, 9)		457379.262(187)	3.9629	1.137	170.364	
S02	17(5,13) - 17(4,14)		457466.871(67)	3.1305	8.722	125.184	
S02	46(14,32) - 47(13,35)		458105.617(820)	3.7209	5.926	1007.556	
S02 V2=1	22(5,17) - 22(4,18)		458117.891(254)	3.1057	11.921	190.131	
S02	15(5,11) - 15(4,12)		458386.801(51)	3.1410	7.494	104.035	
S02	14(5, 9) - 14(4,10)		458531.734(43)	3.1484	6.886	94.435	
S02	31(5,27) - 31(4,28)		458611.988(174)	3.0760	17.662	345.412	
S02	13(5, 9) - 13(4,10)		459070.609(37)	3.1561	6.276	85.465	
S02	12(5, 7) - 12(4, 8)		459258.043(32)	3.1665	5.666	77.149	
S02 V2=1	36(2,34) - 37(1,37)		459502.570(2125)	5.3999	0.097	422.563	
S02	11(5, 7) - 11(4, 8)		459528.473(29)	3.1794	5.052	69.471	
S02	10(5, 5) - 10(4, 6)		459668.449(28)	3.1965	4.431	62.438	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	9(5, 5) - 9(4, 6)		459799.984(30)	3.2196	3.797	56.046	
S02	8(5, 3) - 8(4, 4)		459879.090(33)	3.2530	3.145	50.295	
S02 V2=1	37(12,26) - 38(11,27)		459909.387(8248)	3.7362	4.598	683.527	
S02	7(5, 3) - 7(4, 4)		459936.211(37)	3.3046	2.463	45.185	
S02	6(5, 1) 6(4, 2)		459969.281(41)	3.3946	1.735	40.715	
S02	5(5, 1) - 5(4, 2)		459987.281(45)	3.5918	0.932	36.885	
S02	51(15,37) - 52(14,38)		460021.246(1116)	3.7063	6.700	1212.764	
S02	50(6,44) - 49(7,43)		461410.309(380)	3.6157	8.025	869.777	
S02 V2=1	38(4,34) - 37(5,33)		461496.570(1099)	3.5312	7.493	494.672	
S02 V2=1	11(3, 9) - 10(2, 8)		461497.012(162)	3.3023	3.790	42.481	
S02	56(16,40) - 57(15,43)		461571.563(1511)	3.6963	7.454	1437.175	
S02	20(9,11) - 21(8,14)		461875.699(236)	3.8553	1.871	256.562	
S02 V2=1	5(4, 2) - 4(3, 1)		461882.930(191)	3.0065	3.573	22.100	
S02 V2=1	21(9,13) - 22(8,14)		462315.285(2684)	3.8323	2.080	273.007	
S02 V2=1	20(5,15) - 20(4,16)		462842.297(200)	3.1024	10.612	162.411	
S02	12(2,10) - 11(1,11)		463011.414(41)	3.7670	1.387	41.953	
S02	35(4,32) - 35(3,33)		463326.641(221)	3.1320	16.968	415.761	
S02 V2=1	28(2,26) - 27(3,25)		463398.945(365)	3.2442	10.606	256.945	
S02 V2=1	25(5,21) - 25(4,22)		463915.207(351)	3.0797	13.815	236.109	
S02 V2=1	27(5,23) - 27(4,24)		464069.996(425)	3.0728	15.121	270.138	
S02	33(5,29) - 33(4,30)		464288.113(216)	3.0590	18.827	387.068	
S02 V2=1	23(5,19) - 23(4,20)		464584.613(284)	3.0853	12.512	204.648	
S02	52(5,47) - 52(4,48)		464666.832(1422)	3.0152	32.550	924.807	
S02 V2=1	26(0,26) - 25(1,25)		465052.207(267)	2.8750	22.832	197.612	
S02	46(3,43) - 47(2,46)		465411.551(1709)	5.0828	0.246	701.409	
S02 V2=1	29(5,25) - 29(4,26)		465520.414(508)	3.0637	16.410	306.721	
S02	29(2,28) - 29(1,29)		465621.602(190)	3.5094	5.827	263.554	
S02 V2=1	21(5,17) - 21(4,18)		465677.922(225)	3.0908	11.225	175.764	
S02	26(0,26) - 25(1,25)		465751.336(111)	2.8690	22.851	197.833	
S02	25(10,16) - 26(9,17)		465881.590(293)	3.7915	2.626	362.113	
S02 V2=1	18(5,13) - 18(4,14)		465921.047(159)	3.1045	9.344	137.335	
S02	45(4,42) - 46(1,45)		466172.977(1402)	5.0628	0.250	672.973	
S02	28(2,26) - 27(3,25)		466789.988(100)	3.2271	10.703	256.741	
S02	40(6,34) - 40(5,35)		466888.680(631)	3.0098	25.069	572.494	
S02 V2=1	19(5,15) - 19(4,16)		466889.020(177)	3.0969	9.959	149.463	
S02 V2=1	12(2,10) - 11(1,11)		467096.340(164)	3.7543	1.403	41.943	
S02 V2=1	10(7, 3) - 11(6, 6)		467595.059(977)	4.1611	0.461	104.908	
S02 V2=1	16(5,11) - 16(4,12)		467876.309(137)	3.1112	8.104	114.877	
S02 V2=1	17(5,13) - 17(4,14)		468012.652(145)	3.1047	8.716	125.745	
S02 V2=1	26(10,16) - 27(9,19)		468474.508(4155)	3.7705	2.841	382.357	
S02 V2=1	31(5,27) - 31(4,28)		468772.336(603)	3.0513	17.657	345.840	
S02 V2=1	15(5,11) - 15(4,12)		468936.082(136)	3.1153	7.490	104.610	
S02 V2=1	14(5, 9) - 14(4,10)		469086.090(140)	3.1227	6.882	95.018	
S02	30(11,19) - 31(10,22)		469422.441(371)	3.7483	3.391	487.002	
S02 V2=1	13(5, 9) - 13(4,10)		469620.375(149)	3.1304	6.273	86.054	
S02 V2=1	12(5, 7) - 12(4, 8)		469808.852(161)	3.1408	5.664	77.743	
S02 V2=1	11(5, 7) - 11(4, 8)		470077.359(175)	3.1537	5.050	70.070	
S02 V2=1	10(5, 5) - 10(4, 6)		470217.023(189)	3.1707	4.429	63.042	
S02 V2=1	9(5, 5) - 9(4, 6)		470347.559(204)	3.1939	3.796	56.655	
S02 V2=1	8(5, 3) - 8(4, 4)		470426.051(218)	3.2272	3.144	50.908	
S02 V2=1	7(5, 3) - 7(4, 4)		470482.488(232)	3.2789	2.462	45.802	
S02 V2=1	6(5, 1) - 6(4, 2)		470514.992(244)	3.3688	1.734	41.335	
S02 V2=1	5(5, 1) - 5(4, 2)		470532.480(255)	3.5660	0.932	37.507	
S02 V2=1	26(1,25) - 25(2,24)		470857.457(286)	3.0097	16.130	211.080	
S02	34(2,32) - 34(1,33)		471190.438(158)	3.2577	11.739	377.306	
S02 V2=1	35(4,32) - 35(3,33)		471520.617(747)	3.1113	17.032	415.873	

TABLE 3. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	9(7, 3) - 10(6, 4)		471559.695(149)	4.2830	0.304	96.502	
S02	26(1,25) - 25(2,24)		471894.516(105)	3.0014	16.196	211.076	
S02	38(4,34) - 37(5,33)		472038.051(146)	3.4945	7.554	493.983	
S02	44(5,39) - 43(6,38)		472139.781(237)	3.5554	7.582	668.771	
S02	35(12,24) - 36(11,25)		472521.793(482)	3.7169	4.161	631.211	
S02	35(5,31) - 35(4,32)		472706.629(278)	3.0370	19.886	431.216	
S02	6(4, 2) - 5(3, 3)		472851.410(24)	3.0296	3.701	24.943	
S02	37(3,35) - 38(0,38)		473433.973(1077)	5.3909	0.093	445.701	
S02 V2=1	29(2,28) - 29(1,29)		473504.074(703)	3.4889	5.858	263.237	
S02 V2=1	31(11,21) - 32(10,22)		474132.730(6148)	3.7261	3.608	511.105	
S02 V2=1	33(5,29) - 33(4,30)		474321.551(710)	3.0348	18.830	387.475	
S02	23(5,19) - 24(2,22)		474340.195(155)	5.3334	0.066	203.463	
S02 V2=1	15(8, 8) 16(7, 9)		474883.816(1724)	3.9178	1.137	172.216	
S02	40(13,27) - 41(12,30)		475199.930(645)	3.6928	4.933	794.717	
S02	33(3,31) - 33(2,32)		475865.871(157)	3.2364	11.623	356.530	
S02	14(8, 6) - 15(7, 9)		476621.488(199)	3.9609	0.944	160.139	
S02	54(7,47) - 54(6,48)		476629.922(3193)	2.9298	38.121	1023.549	
S02	45(14,32) - 46(13,33)		477473.906(873)	3.6739	5.706	977.494	
S02 V2=1	34(2,32) - 34(1,33)		478035.680(745)	3.2402	11.806	377.155	
S02	30(1,29) - 30(0,30)		478825.617(222)	3.4866	5.838	281.446	
S02 V2=1	36(12,24) - 37(11,27)		479310.570(8779)	3.6918	4.379	659.232	
S02	50(15,35) - 51(14,38)		479358.063(1181)	3.6586	6.480	1179.510	
S02	46(4,42) - 46(3,43)		479734.109(653)	3.0412	24.678	716.934	
S02 V2=1	40(6,34) - 40(5,35)		480203.523(1446)	2.9787	24.958	573.088	
S02	55(16,40) - 56(15,41)		480864.531(1589)	3.6479	7.238	1400.734	
S02 V2=1	6(4, 2) - 5(3, 3)		481004.105(192)	3.0109	3.701	25.290	
S02	19(9,11) - 20(8,12)		481166.039(253)	3.8311	1.664	243.137	
S02	38(2,36) - 39(1,39)		481232.621(1295)	5.3922	0.090	468.867	
S02 V2=1	20(9,11) - 21(8,14)		481617.594(2835)	3.8045	1.870	258.950	
S02	56(4,52) - 57(3,55)		481881.008(3199)	4.8781	0.431	1047.825	
S02	25(2,24) - 24(1,23)		482503.227(117)	2.9826	15.225	194.981	
S02 V2=1	35(5,31) - 35(4,32)		482608.527(832)	3.0134	19.899	431.601	
S02 V2=1	25(2,24) - 24(1,23)		483016.344(282)	2.9866	15.164	194.969	
S02 V2=1	27(1,27) - 26(0,26)		483556.387(304)	2.8214	23.845	213.124	
S02 V2=1	33(3,31) - 33(2,32)		483783.578(697)	3.2164	11.683	356.404	
S02	40(3,37) - 40(2,38)		483994.699(273)	3.1093	17.895	534.312	
S02	37(5,33) - 37(4,34)		484200.547(364)	3.0097	20.812	477.832	
S02	27(1,27) - 26(0,26)		484227.477(120)	2.8155	23.864	213.369	
S02	13(3,11) - 12(2,10)		484270.867(59)	3.2662	4.149	57.398	
S02	55(5,51) - 56(2,54)		485036.152(2742)	4.8547	0.438	1012.962	
S02	24(10,14) - 25(9,17)		485209.719(317)	3.7579	2.413	345.486	
S02 V2=1	30(1,29) - 30(0,30)		486721.672(799)	3.4666	5.870	281.102	
S02 V2=1	9(7, 3) - 10(6, 4)		486770.398(1016)	4.2454	0.304	97.887	
S02 V2=1	25(10,16) - 26(9,17)		487814.516(4398)	3.7353	2.626	365.100	
S02	38(6,32) - 38(5,33)		488729.316(485)	2.9661	22.974	520.644	
S02	29(11,19) - 30(10,20)		488775.430(401)	3.7099	3.175	467.174	
S02	53(8,46) - 54(5,49)		489644.660(5148)	4.8383	0.426	1010.427	
S02	33(6,28) - 34(3,31)		489809.691(369)	5.0749	0.155	404.456	
S02 V2=1	40(3,37) - 40(2,38)		489816.078(943)	3.0946	18.014	534.331	
S02	37(4,34) - 37(3,35)		489820.184(279)	3.0768	17.229	461.493	
S02 V2=1	13(3,11) - 12(2,10)		489928.641(168)	3.2545	4.152	57.523	
S02	11(4, 8) - 12(1,11)		490538.723(46)	6.0620	0.005	53.108	
S02	8(7, 1) - 9(6, 4)		490732.527(155)	4.4379	0.169	90.116	
S02	34(12,22) - 35(11,25)		491885.809(519)	3.6755	3.943	608.183	
S02	7(4, 4) - 6(3, 3)		491934.770(25)	3.0227	3.852	28.776	
S02 V2=1	30(11,19) - 31(10,22)		493496.316(6517)	3.6869	3.391	490.649	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	43(7,37) - 44(4,40)		493642.395(1644)	4.9255	0.277	673.522	
S02 V2=1	37(5,33) - 37(4,34)		493978.895(972)	2.9868	20.840	478.195	
S02 V2=1	14(8, 6) - 15(7, 9)		494111.102(1806)	3.9178	0.944	161.998	
S02	39(13,27) - 40(12,28)		494561.070(690)	3.6496	4.714	768.491	
S02	12(3, 9) - 11(2,10)		494779.715(51)	3.2576	3.674	48.802	
S02	60(6,54) - 60(5,55)		494915.883(3328)	2.9029	40.197	1234.464	
S02	13(8, 6) - 14(7, 7)		495841.484(211)	3.9730	0.759	150.555	
S02	44(14,30) - 45(13,33)		496818.648(928)	3.6295	5.487	948.072	
S02 V2=1	37(4,34) - 37(3,35)		498206.359(900)	3.0565	17.303	461.577	
S02	49(15,35) - 50(14,36)		498673.461(1248)	3.6135	6.260	1146.896	
S02 V2=1	35(12,24) - 36(11,25)		498683.102(9310)	3.6504	4.161	635.578	
S02	39(5,35) - 39(4,36)		498976.766(476)	2.9772	21.591	526.893	
S02 V2=1	7(4, 4) - 6(3, 3)		500074.785(192)	3.0049	3.853	29.121	
S02	54(16,38) - 55(15,41)		500138.336(1670)	3.6020	7.022	1364.931	
S02 V2=1	28(0,28) - 27(1,27)		500358.719(343)	2.7744	24.853	229.254	
S02	18(9, 9) - 19(8,12)		500431.266(271)	3.8135	1.461	230.352	
S02 V2=1	12(3, 9) - 11(2,10)		500514.949(167)	3.2451	3.684	48.929	
S02	31(2,30) - 31(1,31)		500654.750(261)	3.4426	5.837	299.932	
S02 V2=1	19(9,11) - 20(8,12)		500892.246(2982)	3.7825	1.664	245.534	
S02	28(0,28) - 27(1,27)		501107.941(128)	2.7685	24.871	229.521	
S02	59(17,43) - 60(16,44)		501224.461(2227)	3.5510	7.785	1602.141	
S02 V2=1	38(2,36) - 39(1,39)		501429.352(2598)	5.3363	0.091	468.238	
S02	47(4,44) - 48(1,47)		501578.324(2007)	5.0083	0.238	730.426	
S02 V2=1	38(6,32) - 38(5,33)		502110.871(1222)	2.9360	22.899	521.275	
S02	52(7,45) - 52(6,46)		502404.316(2735)	2.8823	34.977	952.988	
S02	23(10,14) - 24(9,15)		504511.582(341)	3.7287	2.202	329.501	
S02 V2=1	8(7, 1) - 9(6, 4)		505929.027(1052)	4.4019	0.169	91.505	
S02 V2=1	24(10,14) - 25(9,17)		507126.113(4638)	3.7041	2.413	348.484	
S02	36(6,30) - 36(5,31)		507331.211(367)	2.9300	21.161	471.593	
S02	48(3,45) - 49(2,48)		507442.125(2407)	5.0116	0.233	760.028	
S02	28(11,17) - 29(10,20)		508102.195(432)	3.6748	2.960	447.988	
S02 V2=1	39(5,35) - 39(4,36)		508654.285(1133)	2.9550	21.635	527.233	
S02	15(3,13) - 14(2,12)		508709.809(76)	3.2213	4.558	75.150	
S02	39(3,37) - 40(0,40)		508789.445(1528)	5.3447	0.087	492.617	
S02 V2=1	31(2,30) - 31(1,31)		509126.332(887)	3.4221	5.869	299.561	
S02	35(3,33) - 35(2,34)		509206.109(199)	3.1716	11.670	398.776	
S02	7(7, 1) - 8(6, 2)		509891.695(161)	4.7594	0.063	84.369	
S02 V2=1	28(1,27) - 27(2,26)		510617.418(371)	2.8815	18.274	243.874	
S02	8(4, 4) - 7(3, 5)		511089.742(28)	3.0093	4.016	33.247	
S02	33(12,22) - 34(11,23)		511224.438(557)	3.6371	3.725	585.797	
S02	28(1,27) - 27(2,26)		511502.102(122)	2.8741	18.337	243.898	
S02	27(2,26) - 26(1,25)		512076.121(129)	2.8816	17.332	226.817	
S02	36(2,34) - 36(1,35)		512085.105(213)	3.1740	11.732	420.745	
S02 V2=1	27(2,26) - 26(1,25)		512283.285(351)	2.8863	17.270	226.786	
S02 V2=1	29(11,19) - 30(10,20)		512831.859(6883)	3.6510	3.175	470.835	
S02 V2=1	13(8, 6) - 14(7, 7)		513316.266(1883)	3.9316	0.759	152.421	
S02	38(13,25) - 39(12,28)		513898.195(736)	3.6092	4.495	742.906	
S02 V2=1	15(3,13) - 14(2,12)		514250.051(180)	3.2107	4.559	75.267	
S02 V2=1	34(3,31) - 33(4,30)		515012.461(741)	3.2405	9.435	387.475	
S02	12(8, 4) - 13(7, 7)		515042.133(222)	4.0037	0.585	141.611	
S02	54(5,49) - 54(4,50)		515424.379(1749)	2.9088	31.631	993.234	
S02	32(1,31) - 32(0,32)		515657.496(308)	3.4172	5.844	318.997	
S02	43(14,30) - 44(13,31)		516141.098(984)	3.5877	5.267	919.291	
S02	41(5,37) - 41(4,38)		517101.227(613)	2.9397	22.220	578.374	
S02 V2-1	35(3,33) - 35(2,34)		517602.156(875)	3.1517	11.732	398.607	
S02	48(15,33) - 49(14,36)		517968.520(1317)	3.5707	6.041	1114.922	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02 V2=1	34(12,22) - 35(11,25)		518028.715(9840)	3.6118	3.942	612.565	
S02	3(3, 1) - 2(0, 2)		518187.273(28)	7.1910	0.000	1.912	
S02 V2=1	30(2,28) - 29(3,27)		518311.664(478)	3.0491	12.713	293.058	
S02 V2=1	29(1,29) - 28(0,28)		518442.961(388)	2.7258	25.862	245.944	
S02	39(4,36) - 39(3,37)		518751.027(354)	3.0201	17.407	509.589	
S02	29(1,29) - 28(0,28)		519187.848(138)	2.7200	25.881	246.236	
S02 V2=1	8(4, 4) - 7(3, 5)		519216.137(192)	2.9923	4.017	33.589	
S02	53(16,38) - 54(15,39)		519393.906(1754)	3.5583	6.805	1329.767	
S02	17(9, 9) - 18(8,10)		519673.898(289)	3.8034	1.263	218.209	
S02 V2=1	36(2,34) - 36(1,35)		519792.852(948)	3.1558	11.798	420.552	
S02 V2=1	18(9, 9) - 19(8,12)		520141.898(3124)	3.7669	1.461	232.758	
S02	40(2,38) - 41(1,41)		520396.969(1817)	5.3375	0.085	516.953	
S02	58(17,41) - 59(16,44)		520429.121(2324)	3.5134	7.569	1563.792	
S02 V2=1	36(6,30) - 36(5,31)		520647.953(1037)	2.9009	21.110	472.262	
S02	30(2,28) - 29(3,27)		521126.922(121)	3.0346	12.823	292.875	
S02	57(5,53) - 58(2,56)		521270.801(3738)	4.7956	0.419	1083.265	
S02	34(3,31) - 33(4,30)		521281.664(131)	3.2162	9.540	387.068	
S02	34(6,28) - 34(5,29)		522192.207(280)	2.9026	19.536	425.330	
S02	58(7,51) - 57(8,50)		523761.898(846)	3.4599	9.097	1169.844	
S02	22(10,12) - 23(9,15)		523789.383(366)	3.7041	1.994	314.157	
S02 V2=1	32(1,31) - 32(0,32)		524247.688(997)	3.3970	5.876	318.597	
S02 V2=1	7(7, 1) - 8(6, 2)		525074.094(1084)	4.7249	0.063	85.762	
S02	58(4,54) - 59(3,57)		525472.594(4357)	4.8006	0.411	1119.290	
S02 V2=1	23(10,14) - 24(9,15)		526411.578(4874)	3.6771	2.202	332.510	
S02 V2=1	39(4,36) - 39(3,37)		527398.531(1088)	3.0002	17.489	509.641	
S02	27(11,17) - 28(10,18)		527404.633(463)	3.6433	2.746	429.443	
S02 V2=1	3(3, 1) - 2(0, 2)		528771.484(227)	7.1779	0.000	1.911	
S02	17(3,15) - 16(2,14)		529290.984(95)	3.1771	5.058	95.589	
S02	50(7,43) - 50(6,44)		529610.336(2298)	2.8327	32.199	885.168	
S02	9(4, 6) - 8(3, 5)		529974.969(33)	2.9923	4.186	38.368	
S02	42(3,39) - 42(2,40)		530031.852(377)	3.0144	17.789	586.013	
S02	48(4,44) - 48(3,45)		530382.266(860)	2.9361	24.263	776.955	
S02	32(12,20) - 33(11,23)		530539.313(597)	3.6017	3.509	564.051	
S02	21(5,17) - 22(2,20)		531902.492(148)	5.4083	0.036	172.676	
S02 V2=1	28(11,17) - 29(10,20)		532141.328(7246)	3.6183	2.959	451.661	
S02 V2=1	12(8, 4) - 13(7, 7)		532502.188(1955)	3.9640	0.584	143.483	
S02	37(13,25) - 38(12,26)		533212.711(784)	3.5713	4.277	717.962	
S02	32(6,26) - 32(5,27)		533497.148(218)	2.8835	18.032	381.827	
S02	11(8, 4) - 12(7, 5)		534226.141(233)	4.0609	0.422	133.307	
S02 V2=1	17(3,15) - 16(2,14)		534652.086(202)	3.1679	5.054	95.698	
S02 V2=1	34(6,28) - 34(5,29)		535392.805(885)	2.8745	19.500	426.036	
S02	42(14,28) - 43(13,31)		535442.469(1042)	3.5482	5.048	891.150	
S02 V2=1	30(0,30) - 29(1,29)		535558.188(435)	2.6814	26.869	263.237	
S02	33(2,32) - 33(1,33)		535944.297(364)	3.3800	5.845	338.653	
S02	30(0,30) - 29(1,29)		536362.609(148)	2.6755	26.888	263.554	
S02	47(15,33) - 48(14,34)		537244.297(1388)	3.5302	5.821	1083.587	
S02	49(4,46) - 50(1,49)		537620.281(2802)	4.9573	0.226	790.212	
S02 V2=1	9(4, 6) - 8(3, 5)		538090.156(191)	2.9760	4.188	38.706	
S02	43(5,39) - 43(4,40)		538498.281(776)	2.8979	22.705	632.257	
S02	52(16,36) - 53(15,39)		538632.148(1841)	3.5168	6.587	1295.242	
S02	16(9, 7) - 17(8,10)		538896.352(306)	3.8023	1.071	206.706	
S02 V2=1	40(4,36) - 39(5,35)		538920.195(1401)	3.2900	8.624	544.200	
S02 V2=1	17(9, 9) - 18(8,10)		539369.086(3261)	3.7587	1.263	220.623	
S02	57(17,41) - 58(16,42)		539618.516(2425)	3.4769	7.353	1526.080	
S02	9(4, 6) - 10(1, 9)		540201.906(37)	6.3739	0.002	38.027	
S02	14(2,12) - 13(1,13)		540604.570(58)	3.7350	1.089	57.117	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	52(6,46) - 51(7,45)		541705.266(567)	3.3972	8.527	934.918	
S02	14(3,11) - 13(2,12)		541750.891(71)	3.1998	3.710	64.627	
S02	30(6,24) - 30(5,25)		541810.867(179)	2.8716	16.606	341.047	
S02	21(10,12) - 22(9,13)		543045.219(390)	3.6846	1.788	299.453	
S02 V2=1	29(2,28) - 28(1,27)		543372.070(435)	2.7902	19.370	260.907	
S02	29(2,28) - 28(1,27)		543413.734(142)	2.7850	19.431	260.960	
S02	37(3,35) - 37(2,36)		543467.500(265)	3.1094	11.700	443.365	
S02	41(3,39) - 42(0,42)		544575.125(2128)	5.3016	0.083	541.873	
S02 V2=1	14(2,12) - 13(1,13)		545017.984(181)	3.7219	1.104	57.087	
S02 V2=1	33(2,32) - 33(1,33)		545021.008(1100)	3.3595	5.877	338.224	
S02	37(6,32) - 37(5,33)		545319.266(436)	2.8441	21.331	493.983	
S02	35(6,30) - 35(5,31)		545517.828(328)	2.8486	19.966	446.984	
S02 V2=1	22(10,12) - 23(9,15)		545673.109(5104)	3.6545	1.993	317.176	
S02	19(3,17) - 18(2,16)		546579.844(113)	3.1308	5.694	118.685	
S02 V2=1	32(6,26) - 32(5,27)		546582.891(759)	2.8563	18.005	382.567	
S02	26(11,15) - 27(10,18)		546684.578(495)	3.6153	2.534	411.539	
S02	39(6,34) - 39(5,35)		546696.391(578)	2.8371	22.663	543.537	
S02	33(6,28) - 33(5,29)		546803.242(250)	2.8513	18.591	402.555	
S02 V2=1	14(3,11) - 13(2,12)		547453.266(176)	3.1879	3.726	64.744	
S02	28(6,22) - 28(5,23)		547802.469(154)	2.8652	15.236	302.957	
S02	50(3,47) - 51(2,50)		547954.727(3312)	4.9507	0.222	820.982	
S02	31(6,26) - 31(5,27)		548734.672(198)	2.8532	17.223	360.710	
S02 V2=1	30(1,29) - 29(2,28)		548775.781(470)	2.7696	20.387	279.032	
S02	40(4,36) - 39(5,35)		548839.500(209)	3.2580	8.715	543.537	
S02	10(4, 6) - 9(3, 7)		549303.406(40)	2.9718	4.356	44.115	
S02	30(1,29) - 29(2,28)		549566.625(140)	2.7627	20.448	279.086	
S02	41(4,38) - 41(3,39)		549712.688(449)	2.9631	17.524	560.038	
S02	31(12,20) - 32(11,21)		549832.016(637)	3.5691	3.293	542.947	
S02	41(6,36) - 41(5,37)		550148.141(755)	2.8267	23.932	595.623	
S02	29(6,24) - 29(5,25)		550946.992(167)	2.8549	15.874	321.458	
S02 V2=1	27(11,17) - 28(10,18)		551426.609(7604)	3.5890	2.746	433.128	
S02	38(2,36) - 38(1,37)		551622.547(300)	3.1002	11.734	466.519	
S02 V2=1	11(8, 4) - 12(7, 5)		551671.586(2023)	4.0228	0.422	135.184	
S02 V2=1	19(3,17) - 18(2,16)		551692.555(235)	3.1231	5.683	118.788	
S02	34(1,33) - 34(0,34)		552068.086(432)	3.3538	5.850	358.891	
S02	26(6,20) - 26(5,21)		552079.031(138)	2.8630	13.910	267.525	
S02 V2=1	37(3,35) - 37(2,36)		552385.109(1088)	3.0896	11.763	443.151	
S02	36(13,23) - 37(12,26)		552505.984(833)	3.5359	4.060	693.658	
S02	27(6,22) - 27(5,23)		553165.070(147)	2.8570	14.549	284.803	
S02	46(5,41) - 45(6,40)		553215.461(358)	3.3250	8.373	726.150	
S02	10(8, 2) - 11(7, 5)		553396.039(242)	4.1593	0.277	125.643	
S02 V2=1	31(1,31) - 30(0,30)		553398.578(488)	2.6367	27.876	281.102	
S02	31(1,31) - 30(0,30)		554213.227(161)	2.6309	27.895	281.446	
S02	31(6,26) - 32(3,29)		554559.359(301)	5.0862	0.098	360.516	
S02	41(14,28) - 42(13,29)		554723.945(1102)	3.5110	4.830	863.649	
S02 V2=1	30(6,24) - 30(5,25)		554806.344(647)	2.8449	16.585	341.819	
S02	24(6,18) - 24(5,19)		555121.664(123)	2.8641	12.618	234.726	
S02	25(6,20) - 25(5,21)		555204.258(131)	2.8600	13.252	250.746	
S02	5(5, 1) - 4(4, 0)		555666.461(41)	2.6626	4.492	33.693	
S02	48(7,41) - 48(6,42)		555753.242(1895)	2.7857	29.823	820.138	
S02	43(6,38) - 43(5,39)		556141.031(970)	2.8122	25.109	650.220	
S02	46(15,31) - 47(14,34)		556501.805(1461)	3.4918	5.602	1052.892	
S02	23(6,18) - 23(5,19)		556960.023(116)	2.8643	11.980	219.286	
S02	5(3, 3) - 4(0, 4)		557087.633(29)	6.0723	0.002	6.360	
S02	22(6,16) - 22(5,17)		557283.359(108)	2.8679	11.354	204.543	
S02 V2=1	10(4, 6) - 9(3, 7)		557402.391(190)	2.9562	4.358	44.449	

TABLE 1. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
SO2 V2=1	37(6,32) - 37(5,33)		557775.031(1107)	2.8188	21.312	494.672	
SO2	51(16,36) - 52(15,37)		557853.945(1929)	3.4774	6.369	1261.356	
SO2	59(5,55) - 60(2,58)		558077.039(5019)	4.7403	0.401	1155.894	
SO2	15(9, 7) - 16(8, 8)		558100.930(322)	3.8120	0.886	195.843	
SO2 V2=1	35(6,30) - 35(5,31)		558105.484(958)	2.8230	19.945	447.699	
SO2	21(6,16) - 21(5,17)		558391.047(100)	2.8701	10.730	190.419	
SO2 V2=1	16(9, 7) - 17(8,10)		558576.219(3392)	3.7593	1.071	209.128	
SO2	42(2,40) - 43(1,43)		558654.164(2503)	5.2898	0.081	567.378	
SO2	56(17,39) - 57(16,42)		558793.406(2530)	3.4416	7.136	1489.007	
SO2	20(6,14) - 20(5,15)		558812.648(91)	2.8742	10.113	176.962	
SO2 V2=1	39(6,34) - 39(5,35)		558986.242(1277)	2.8121	22.648	544.200	
SO2 V2=1	33(6,28) - 33(5,29)		559489.234(826)	2.8256	18.570	403.296	
SO2	19(6,14) - 19(5,15)		559500.516(83)	2.8781	9.498	164.140	
SO2	18(6,12) - 18(5,13)		559882.258(74)	2.8833	8.886	151.971	
SO2 V2=1	38(2,36) - 38(1,37)		560153.641(1184)	3.0815	11.800	466.279	
SO2	17(6,12) - 17(5,13)		560319.016(65)	2.8890	8.277	140.444	
SO2	16(6,10) - 16(5,11)		560613.633(57)	2.8960	7.667	129.563	
SO2 V2=1	28(6,22) - 28(5,23)		560735.914(543)	2.8389	15.219	303.756	
SO2	15(6,10) - 15(5,11)		560891.078(50)	2.9042	7.057	119.325	
SO2	14(6, 8) - 14(5, 9)		561094.945(46)	2.9142	6.445	109.730	
SO2	13(6, 8) - 13(5, 9)		561265.742(44)	2.9265	5.827	100.778	
SO2 V2=1	34(1,33) - 34(0,34)		561335.031(1223)	3.3334	5.882	358.430	
SO2	21(3,19) - 20(2,18)		561361.359(130)	3.0803	6.509	144.397	
SO2	12(6, 6) - 12(5, 7)		561393.016(45)	2.9421	5.202	92.468	
SO2 V2=1	31(6,26) - 31(5,27)		561489.102(707)	2.8274	17.204	361.477	
SO2	11(6, 6) - 11(5, 7)		561490.641(48)	2.9623	4.565	84.799	
SO2	10(6, 4) - 10(5, 5)		561560.422(54)	2.9896	3.913	77.771	
SO2	9(6, 4) - 9(5, 5)		561608.758(60)	3.0283	3.237	71.383	
SO2	8(6, 2) - 8(5, 3)		561639.516(66)	3.0872	2.529	65.635	
SO2	7(6, 2) - 7(5, 3)		561656.891(73)	3.1871	1.773	60.527	
SO2	6(6, 0) - 6(5, 1)		561664.344(79)	3.3987	0.944	56.058	
SO2	20(10,10) - 21(9,13)		562281.125(414)	3.6704	1.587	285.391	
SO2	45(5,41) - 45(4,42)		562963.789(968)	2.8527	23.063	688.523	
SO2 V2=1	29(6,24) - 29(5,25)		563745.531(598)	2.8291	15.857	322.249	
SO2	41(7,35) - 42(4,38)		564031.734(1349)	4.8967	0.189	616.467	
SO2	51(8,44) - 52(5,47)		564476.078(4525)	4.7792	0.307	940.307	
SO2 V2=1	21(10,12) - 22(9,13)		564912.813(5328)	3.6369	1.788	302.482	
SO2 V2=1	26(6,20) - 26(5,21)		564973.406(445)	2.8370	13.896	268.349	
SO2	45(6,40) - 45(5,41)		565068.305(1225)	2.7931	26.165	707.301	
SO2	25(11,15) - 26(10,16)		565943.797(528)	3.5910	2.325	394.275	
SO2 V2=1	27(6,22) - 27(5,23)		565989.539(495)	2.8313	14.535	285.618	
SO2 V2=1	5(5, 1) - 4(4, 0)		566144.867(279)	2.6420	4.492	34.318	
SO2 V2=1	21(3,19) - 20(2,18)		566153.195(281)	3.0743	6.488	144.495	
SO2	11(4, 8) - 10(3, 7)		567592.758(48)	2.9518	4.528	50.538	
SO2 V2=1	5(3, 3) - 4(0, 4)		567646.313(235)	6.0611	0.002	6.356	
SO2 V2=1	24(6,18) - 24(5,19)		567992.734(355)	2.8383	12.607	235.574	
SO2 V2=1	25(6,20) - 25(5,21)		568042.164(400)	2.8343	13.240	251.584	
SO2	56(5,51) - 56(4,52)		568467.898(2177)	2.8063	30.945	1063.899	
SO2	30(12,18) - 31(11,21)		569104.094(678)	3.5394	3.079	522.483	
SO2 V2=1	32(2,30) - 31(3,29)		569259.883(608)	2.8846	14.935	331.597	
SO2 V2=1	23(6,18) - 23(5,19)		569803.484(314)	2.8386	11.970	220.145	
SO2 V2=1	22(6,16) - 22(5,17)		570140.797(276)	2.8422	11.346	205.412	
SO2 V2=1	26(11,15) - 27(10,18)		570689.539(7956)	3.5630	2.534	415.235	
SO2 V2=1	32(0,32) - 31(1,31)		570690.938(544)	2.5948	28.882	299.561	
SO2 V2=1	10(8, 2) - 11(7, 5)		570827.000(2085)	4.1226	0.277	127.525	
SO2 V2=1	21(6,16) - 21(5,17)		571235.547(245)	2.8445	10.722	191.298	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	35(2,34) - 35(1,35)		571381.531(510)	3.3213	5.852	379.717	
S02	32(2,30) - 31(3,29)		571532.906(145)	2.8723	15.052	331.436	
S02	32(0,32) - 31(1,31)		571553.828(176)	2.5889	28.900	299.932	
S02 V2=1	20(6,14) - 20(5,15)		571661.922(222)	2.8485	10.106	177.850	
S02	35(13,23) - 36(12,24)		571779.359(883)	3.5030	3.843	669.995	
S02 V2=1	19(6,14) - 19(5,15)		572343.703(209)	2.8525	9.492	165.037	
S02	9(8, 2) - 10(7, 3)		572554.211(251)	4.3309	0.152	118.618	
S02 V2=1	18(6,12) - 18(5,13)		572726.242(207)	2.8576	8.882	152.876	
S02 V2=1	17(6,12) - 17(5,13)		573159.875(216)	2.8634	8.272	141.357	
S02 V2=1	16(6,10) - 16(5,11)		573453.773(233)	2.8703	7.664	130.484	
S02 V2=1	15(6,10) - 15(5,11)		573729.305(258)	2.8785	7.054	120.252	
S02 V2=1	14(6, 8) - 14(5, 9)		573932.008(285)	2.8885	6.442	110.665	
S02	40(14,26) - 41(13,29)		573986.680(1163)	3.4760	4.611	836.788	
S02	51(4,48) - 52(1,51)		574041.938(3826)	4.9097	0.216	852.333	
S02 V2=1	13(6, 8) - 13(5, 9)		574101.367(315)	2.9009	5.825	101.719	
S02	44(3,41) - 44(2,42)		574210.898(520)	2.9312	17.743	640.030	
S02 V2=1	12(6, 6) - 12(5, 7)		574227.445(345)	2.9164	5.200	93.414	
S02 V2=1	11(6, 6) - 11(5, 7)		574323.875(375)	2.9367	4.564	85.750	
S02 V2=1	10(6, 4) - 10(5, 5)		574392.578(404)	2.9640	3.912	78.727	
S02 V2=1	9(6, 4) - 9(5, 5)		574439.906(431)	3.0027	3.237	72.344	
S02 V2=1	8(6, 2) - 8(5, 3)		574469.758(457)	3.0615	2.529	66.600	
S02 V2=1	7(6, 2) - 7(5, 3)		574486.305(480)	3.1615	1.772	61.495	
S02 V2=1	6(6, 0) - 6(5, 1)		574493.031(501)	3.3730	0.944	57.029	
S02	23(3,21) - 22(2,20)		574587.828(144)	3.0243	7.548	172.676	
S02	6(5, 1) - 5(4, 2)		574807.469(37)	2.6847	4.558	36.885	
S02 V2=1	11(4, 8) - 10(3, 7)		575685.469(190)	2.9367	4.531	50.867	
S02	45(15,31) - 46(14,32)		575742.055(1536)	3.4554	5.383	1022.836	
S02 V2=1	31(2,30) - 30(1,29)		575803.234(538)	2.6988	21.454	297.337	
S02	31(2,30) - 30(1,29)		576042.359(159)	2.6933	21.514	297.418	
S02	50(16,34) - 51(15,37)		577060.172(2020)	3.4399	6.151	1228.108	
S02	47(6,42) - 47(5,43)		577216.156(1520)	2.7691	27.080	766.843	
S02	14(9, 5) - 15(8, 8)		577289.805(339)	3.8336	0.709	185.620	
S02 V2=1	15(9, 7) - 16(8, 8)		577765.594(3517)	3.7706	0.886	198.272	
S02	55(17,39) - 56(16,40)		577954.555(2639)	3.4074	6.918	1452.571	
S02	39(3,37) - 39(2,38)		578364.820(368)	3.0501	11.721	490.297	
S02 V2=1	23(3,21) - 22(2,20)		578983.930(337)	3.0201	7.512	172.770	
S02	46(7,39) - 46(6,40)		579036.188(1536)	2.7446	27.785	757.923	
S02	50(4,46) - 50(3,47)		580134.180(1131)	2.8412	24.022	839.259	
S02	43(3,41) - 44(0,44)		580609.063(2909)	5.2613	0.078	593.467	
S02 V2=1	35(2,34) - 35(1,35)		581075.094(1342)	3.3007	5.884	379.225	
S02	19(10,10) - 20(9,11)		581499.039(438)	3.6625	1.390	271.968	
S02 V2=1	36(3,33) - 35(4,32)		581607.953(930)	3.0297	11.261	431.601	
S02	43(4,40) - 43(3,41)		582291.961(570)	2.9066	17.600	612.834	
S02 V2=1	20(10,10) - 21(9,13)		584132.719(5545)	3.6245	1.587	288.429	
S02	24(11,13) - 25(10,16)		585183.977(560)	3.5706	2.117	377.653	
S02 V2=1	6(5, 1) - 5(4, 2)		585273.063(273)	2.6649	4.558	37.507	
S02 V2=1	32(1,31) - 31(2,30)		585812.297(586)	2.6697	22.475	316.544	
S02	32(1,31) - 31(2,30)		586556.578(163)	2.6632	22.534	316.632	
S02	36(3,33) - 35(4,32)		587097.211(174)	3.0086	11.393	431.216	
S02	52(3,49) - 53(2,52)		587317.125(4463)	4.8978	0.211	884.268	
S02	25(3,23) - 24(2,22)		587371.039(156)	2.9623	8.843	203.463	
S02	12(4, 8) - 11(3, 9)		587568.359(57)	2.9278	4.688	57.549	
S02 V2=1	39(3,37) - 39(2,38)		587839.383(1337)	3.0303	11.785	490.033	
S02	36(1,35) - 36(0,36)		588187.445(604)	3.2953	5.856	401.126	
S02	29(12,18) - 30(11,19)		588357.023(720)	3.5126	2.867	502.660	
S02 V2=1	33(1,33) - 32(0,32)		588390.078(605)	2.5533	29.888	318.597	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	33(1,33) - 32(0,32)		589272.039(195)	2.5474	29.906	318.997	
S02	7(4, 4) - 8(1, 7)		589599.664(35)	6.8183	0.000	25.518	
S02	60(8,52) - 60(7,53)		589651.227(6197)	2.6826	39.495	1265.483	
S02 V2=1	25(11,15) - 26(10,16)		589931.883(8301)	3.5406	2.324	397.983	
S02 V2=1	9(8, 2) - 10(7, 3)		589970.797(2142)	4.2957	0.152	120.505	
S02	40(2,38) - 40(1,39)		590075.938(429)	3.0341	11.741	514.629	
S02	47(5,43) - 47(4,44)		590189.953(1190)	2.8051	23.317	747.156	
S02	34(13,21) - 35(12,24)		591034.117(935)	3.4725	3.627	646.973	
S02 V2=1	25(3,23) - 24(2,22)		591294.906(403)	2.9598	8.791	203.555	
S02	8(8, 0) - 9(7, 3)		591702.859(259)	4.6710	0.056	112.232	
S02	19(5,15) - 20(2,18)		591858.148(135)	5.5146	0.019	144.397	
S02	49(6,44) - 49(5,45)		592740.977(1858)	2.7404	27.843	828.820	
S02	39(14,26) - 40(13,27)		593231.813(1226)	3.4432	4.394	810.568	
S02	7(5, 3) - 6(4, 2)		593945.070(34)	2.6937	4.668	40.715	
S02	16(3,13) - 15(2,14)		593963.141(93)	3.1523	3.573	82.937	
S02	44(15,29) - 45(14,32)		594966.023(1612)	3.4210	5.164	993.420	
S02 V2=1	12(4, 8) - 11(3, 9)		595636.859(190)	2.9134	4.692	57.875	
S02	49(16,34) - 50(15,35)		596251.680(2113)	3.4042	5.932	1195.500	
S02	44(2,42) - 45(1,45)		596252.672(3387)	5.2473	0.077	620.141	
S02	13(9, 5) - 14(8, 6)		596465.039(354)	3.8778	0.543	176.038	
S02 V2=1	14(9, 5) - 15(8, 8)		596939.391(3635)	3.7957	0.709	188.057	
S02	54(17,37) - 55(16,40)		597102.688(2751)	3.3744	6.701	1416.774	
S02	59(18,42) - 60(17,43)		597532.086(3559)	3.4386	6.720	1657.205	
S02	7(3, 5) - 6(0, 6)		597601.141(34)	5.4033	0.009	13.313	
S02 V2=1	36(1,35) - 36(0,36)		598118.891(1480)	3.2748	5.888	400.601	
S02	44(7,37) - 44(6,38)		598535.102(1225)	2.7114	25.988	698.521	
S02 V2=1	40(2,38) - 40(1,39)		599388.867(1456)	3.0150	11.806	514.337	
S02 V2=1	16(3,13) - 15(2,14)		599630.203(193)	3.1406	3.598	83.041	
S02	18(10, 8) - 19(9,11)		600700.813(462)	3.6619	1.198	259.187	
S02	27(3,25) - 26(2,24)		600935.977(166)	2.8945	10.411	236.696	
S02	13(4,10) - 12(3, 9)		604367.461(67)	2.9090	4.859	65.306	
S02	23(11,13) - 24(10,14)		604406.781(593)	3.5544	1.913	361.671	
S02	60(7,53) - 59(8,52)		605118.352(1223)	3.2676	9.500	1245.298	
S02	34(0,34) - 33(1,33)		606704.156(219)	2.5079	30.911	338.653	
S02	37(2,36) - 37(1,37)		606894.328(711)	3.2661	5.858	423.122	
S02	28(12,16) - 29(11,19)		607592.250(762)	3.4889	2.656	483.478	
S02	33(2,32) - 32(1,31)		609558.836(185)	2.6065	23.580	336.198	
S02	33(13,21) - 34(12,22)		610271.531(987)	3.4445	3.413	624.591	
S02	53(4,50) - 54(1,53)		610658.070(5119)	4.8654	0.206	916.786	
S02	51(6,46) - 51(5,47)		611659.641(2239)	2.7072	28.453	893.209	
S02	38(14,24) - 39(13,27)		612460.430(1290)	3.4125	4.177	784.988	
S02	8(5, 3) - 7(4, 4)		613076.328(33)	2.6942	4.806	45.185	
S02	41(3,39) - 41(2,40)		613675.547(520)	2.9938	11.736	539.568	
S02	42(7,35) - 42(6,36)		614115.320(962)	2.6863	24.349	641.914	
S02	43(15,29) - 44(14,30)		614174.664(1690)	3.3884	4.946	964.644	
S02	48(16,32) - 49(15,35)		615429.289(2208)	3.3704	5.714	1163.530	
S02	12(9, 3) - 13(8, 6)		615628.586(368)	3.9469	0.390	167.095	
S02	45(4,42) - 45(3,43)		616100.547(725)	2.8515	17.648	667.972	
S02	53(17,37) - 54(16,38)		616238.531(2865)	3.3425	6.483	1381.614	
S02	29(3,27) - 28(2,26)		616472.422(177)	2.8217	12.232	272.311	
S02	46(3,43) - 46(2,44)		616526.227(710)	2.8581	17.726	696.368	
S02	58(18,40) - 59(17,43)		616615.891(3693)	3.3977	6.582	1618.860	
S02	45(3,43) - 46(0,46)		616765.758(3907)	5.2238	0.075	647.399	
S02	34(2,32) - 33(3,31)		618152.516(180)	2.7353	17.310	372.404	
S02	58(8,50) - 58(7,51)		619458.148(5364)	2.6339	36.846	1187.315	
S02	49(5,45) - 49(4,46)		619798.430(1448)	2.7561	23.489	808.146	

TABLE 7. Measured and calculated microwave spectrum of $^{32}SO_2$, $^{33}SO_2$, and $^{34}SO_2$ listed by increasing frequency (MHz) — Continued

	Transition $J'(K_-,K_+) - J''(K_-,K_+)$	Measured Frequency	Calculated Frequency	-log(A)	S_{ij}	Energy lower st.	Reference
S02	17(10, 8) - 18(9, 9)		619888.219(485)	3.6699	1.012	247.045	
S02	58(5,53) - 58(4,54)		621621.781(2729)	2.7113	30.498	1136.818	
S02	34(1,33) - 33(2,32)		622827.945(196)	2.5729	24.600	356.530	
S02	29(6,24) - 30(3,27)		623176.102(260)	5.1189	0.060	319.048	
S02	22(11,11) - 23(10,14)		623613.781(626)	3.5428	1.713	346.329	
S02	38(1,37) - 38(0,38)		624105.547(837)	3.2408	5.861	445.701	
S02	35(1,35) - 34(0,34)		624345.406(248)	2.4690	31.916	358.891	
S02	42(4,38) - 41(5,37)		624888.281(315)	3.0431	10.161	595.623	
S02	54(3,51) - 55(2,54)		625822.359(5905)	4.8508	0.202	949.887	
S02	14(4,10) - 13(3,11)		626087.344(79)	2.8822	4.993	73.551	
S02	40(7,33) - 40(6,34)		626169.625(744)	2.6683	22.811	588.068	
S02	54(6,48) - 53(7,47)		626491.859(851)	3.1914	9.190	1002.651	
S02	27(12,16) - 28(11,17)		626811.164(805)	3.4683	2.448	464.936	
S02	16(2,14) - 15(1,15)		627331.164(79)	3.7146	0.831	74.663	
S02	42(2,40) - 42(1,41)		627714.156(612)	2.9742	11.748	565.074	
S02	52(4,48) - 52(3,49)		628011.992(1474)	2.7570	23.897	903.859	
S02	32(13,19) - 33(12,22)		629492.820(1041)	3.4189	3.200	602.849	
S02	37(14,24) - 38(13,25)		631673.609(1356)	3.3838	3.961	760.048	
S02	9(5, 5) - 8(4, 4)		632193.445(35)	2.6889	4.959	50.295	
S02	42(15,27) - 43(14,30)		633368.922(1770)	3.3578	4.728	936.507	
S02	46(2,44) - 47(1,47)		633376.438(4508)	5.2089	0.073	675.241	
S02	47(7,41) - 47(6,42)		633794.219(1788)	2.6377	27.683	786.097	
S02	53(6,48) - 53(5,49)		633853.469(2669)	2.6702	28.921	959.988	
S02	45(7,39) - 45(6,40)		634278.633(1427)	2.6407	26.275	726.150	
S02	47(16,32) - 48(15,33)		634593.820(2305)	3.3383	5.496	1132.199	
S02	11(9, 3) - 12(8, 4)		634782.289(382)	4.0577	0.254	158.791	
S02	31(3,29) - 30(2,28)		634898.672(193)	2.7456	14.245	310.258	
S02	49(7,43) - 49(6,44)		635130.320(2207)	2.6320	29.043	848.592	
S02	38(7,31) - 38(6,32)		635325.914(568)	2.6563	21.343	536.946	
S02	52(17,35) - 53(16,38)		635362.797(2982)	3.3118	6.265	1347.092	
S02	57(18,40) - 58(17,41)		635689.734(3831)	3.3587	6.438	1581.151	
S02	48(5,43) - 47(6,42)		636087.320(550)	3.1112	9.399	786.097	
S02	43(7,37) - 43(6,38)		636091.914(1122)	2.6418	24.844	668.771	
S02	5(4, 2) - 6(1, 5)		637674.445(39)	7.5288	0.000	15.614	
S02	51(7,45) - 51(6,46)		638770.586(2688)	2.6230	30.326	913.611	
S02	41(7,35) - 41(6,36)		638771.875(868)	2.6417	23.410	613.974	
S02	16(10, 6) - 17(9, 9)		639062.969(508)	3.6887	0.834	235.543	
S02	15(4,12) - 14(3,11)		639651.008(90)	2.8683	5.168	82.698	
S02	39(7,33) - 40(4,36)		639772.617(1081)	4.8864	0.126	561.844	
S02	9(3, 7) - 8(0, 8)		641206.586(44)	4.9192	0.028	22.727	
S02	36(0,36) - 35(1,35)		641826.453(284)	2.4317	32.920	379.717	
S02	39(7,33) - 39(6,34)		641915.727(662)	2.6411	21.988	561.772	
S02	36(7,29) - 36(6,30)		642232.844(429)	2.6489	19.926	488.515	
S02	39(2,38) - 39(1,39)		642436.758(979)	3.2141	5.863	468.867	
S02	21(11,11) - 22(10,12)		642806.508(658)	3.5365	1.516	331.628	
S02	35(2,34) - 34(1,33)		643658.852(227)	2.5245	25.634	377.306	
S02	53(7,47) - 53(6,48)		645150.961(3231)	2.6101	31.503	981.132	
S02	37(7,31) - 37(6,32)		645198.992(499)	2.6404	20.588	512.173	
S02	26(12,14) - 27(11,17)		646015.125(848)	3.4511	2.242	447.035	
S02	49(8,42) - 50(5,45)		646049.734(3904)	4.7378	0.216	872.576	
S02	56(8,48) - 56(7,49)		646924.977(4582)	2.5898	34.581	1111.967	
S02	55(4,52) - 56(1,55)		647340.906(6728)	4.8243	0.198	983.571	
S02	34(7,27) - 34(6,28)		647449.180(324)	2.6450	18.550	442.748	
S02	35(7,29) - 35(6,30)		648382.234(375)	2.6402	19.214	465.180	
S02	31(13,19) - 32(12,20)		648699.172(1095)	3.3959	2.988	581.748	
S02	38(3,35) - 37(4,34)		649052.828(245)	2.8277	13.490	477.832	
S02	43(3,41) - 43(2,42)		649234.922(732)	2.9404	11.748	591.178	

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