Microwave Spectra of Molecules of Astrophysical Interest. XVII. Dimethyl Ether

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The microwave spectrum of dimethyl ether (methoxymethane) is critically reviewed and supplemented through calculations which include the contributions of internal rotation and centrifugal distortion in the molecular Hamiltonian. The primary objective of this review is to provide microwave spectral transitions applicable to molecular radio astronomy for the ground vibrational state rotational spectrum of the most abundant isotopic form of dimethyl ether, $^{12}CH_3{}^{16}O^{12}CH_3$. While all measured rotational transitions are included, the predicted transition frequencies were limited to $J \leqslant 15$ in the range 1 GHz to 300 GHz. In order to provide a complete summary of the laboratory studies on dimethyl ether, the rotational constants of the less abundant isotopic species and excited torsional states are also tabulated and all reported rotational studies are referenced.

Key words: Dimethyl ether; internal rotation; interstellar molecules; microwave spectrum; radio astronomy; rotational transitions.

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1. Introduction

This review is part of an extensive series on the microwave spectra of interstellar molecules and is intended to update and augment the existing data on molecular species identified in interstellar molecular clouds. The spectral information provided includes measured and predicted rotational transitions between 1 GHz and 300 GHz. The predicted transitions are limited to those between rotational levels with $J \leqslant 15$. In order to provide complete coverage of the laboratory literature the rotational constants for the less abundant isotopic forms and for excited torsional states are tabulated. The references provided in section 3.1 cover all of the relevant literature.

2. Organization of Tables

The first four tables summarize the fitted and derived molecular constants for dimethyl ether. Tables 5 through 7 contain the measured and predicted transitions for the most abundant isotopic form of dimethyl ether ($^{12}CH_3{}^{16}O^{12}CH_3$). The predicted rotational spectrum of dimethyl ether presented here is based almost entirely on new laboratory measurements carried out at NBS since the data reported in the literature was insufficient for accurate prediction of the rotational spectrum over the range in frequency and energy levels of interest.

2.1. Molecular Parameter Tables

The rotational constants and centrifugal distortion constants listed in table 1 were obtained from a least-squares fit of the measured transitions for the *AA* torsional sublevel in the ground state of dimethyl ether. This analysis was used to predict the transition frequencies for the *AA* sublevel which are listed in tables 5 and 7. Details of the centrifugal distortion calculation and the statistical analysis have been discussed by Kirchhoff [1].[1]

a. Rotational Analysis

A substantial portion of the rotational transitions of dimethyl ether had to be measured in the present work since those reported in previous studies were too limited in the range in J and frequency for accurate prediction of the spectrum up to $J=15$ and 300 GHz. The measurements were carried out on a conventional Stark modulated microwave spectrometer in a parallel plate absorption cell. The method of assigning the torsional sublevels is described in reference [79A]. The parameters given in table 1 were obtained from a least-squares fit to 56 measured transitions up to $J=19$ and resulted in a standard deviation of 0.088 MHz which is comparable to the average uncertainty in the measurements.

Table 3 lists the effective rigid rotor rotational constants for the less abundant isotopic forms of dimethyl ether as well as for excited torsional states. A centrifugal distortion analysis is not possible for these species since only low J transitions have been measured and reported in the references cited in table 3. The structural parameters and dipole moment shown in table 4 were taken from the literature cited.

b. Torsional Fine Structure Analysis

The torsional fine structure produced by the interaction of the hindered rotation (torsion) of the two methyl tops and overall rotation was analyzed by the rigid frame-rigid top model without top-top interaction. The Hamiltonian [2,3,4]

$$\begin{aligned}\mathscr{H} = {} & AP_a{}^2 + BP_b{}^2 + CP_c{}^2 + F\mathscr{P}_1{}^2 + F\mathscr{P}_2{}^2 \\ & + Fp_1{}^2 + \frac{V_3}{2}(1\text{-}\cos 3\alpha_1) \\ & + Fp_2{}^2 + \frac{V_3}{2}(1\text{-}\cos 3\alpha_2) \\ & -2Fp_1\,\mathscr{P}_1 - 2Fp_2\,\mathscr{P}_2\end{aligned} \tag{1}$$

was treated by the internal axis method (IAM) [4,5,6,7]. A computer program, originally written by Woods [6,7], modified by Meier [8] and adapted to the Kiel PDP 10 computer was used. A least-square fitting procedure was incorporated.

The centrifugal distortion effect was treated separately, as described above. For a treatment of top-top interaction see [11]. With the assumed parameters given in table 2 the angle $\angle(a,i)$ between the top and principal inertia axes and the Fourier coefficient $\omega_1(s)$ were least-square fitted to the torsion fine structure splittings. Because of limitations of the computer two differently selected sets of 35 and 36 line splittings from lines up to $J=15$ were used. The fitted parameters from the two fits agreed within the standard deviation for each. In table 2 other derived parameters used by the IAM and principal axis method (PAM) [1–4] are also provided.

The internal rotation parameters for the less abundant isotopic species or for the excited torsional states which have been studied have not been reanalyzed in the present work. It should be noted that the parameters from the analysis by PAM including top-top interaction [11] differ somewhat from the present results since a different model and different set of experimental data was used.

2.2. Microwave Spectral Tables

The measured and predicted rotational transitions for dimethyl ether are listed in tables 5 through 7. In the first column of table 5 the quantum numbers J_{K_-,K_+} for the upper and lower states are shown. These are followed by the symmetry state labels for the torsional substates. For simplicity we have eliminated the subscript, 1, from the A_1A_1: EE: EA_1: A_1E symmetry species labels which apply for the torsional sublevels of the ground state of $^{12}CH_3{}^{16}O^{12}CH_3$. The measured frequencies with their uncertainties in parentheses are then listed, followed by the predicted transition frequencies and their 2 standard deviation (in parentheses). The spin weights, given in the next column, follow the general rule:

$$A_1A_1{:}EE{:}EA_1{:}A_1E = 6{:}16{:}2{:}4 \text{ for the } K_-K_+ = ee,\ oo$$

and

$$A_1A_1{:}EE{:}EA_1{:}A_1E = 10{:}16{:}4{:}6 \text{ for } K_-K_+ = eo,\ oe.$$

The relative intensities are shown in the next column. These are less than unity when "forbidden transitions" occur and borrow intensity from the "allowed transition" for the *EE* and *EA* sublevels. Since the calculation of the splittings for the forbidden transitions has substantially larger uncertainties than that for the allowed transitions, we have not included the "forbidden" lines in tables 5 and 7. However, several "forbidden" transitions have been measured and assignments verified by the internal rotation calculation. These are listed in table 6.

The last two columns of table 5 list the line strength, S_{ij}, and the energy (in cm^{-1}) for the lower state involved in the transition. Only one entry is given for each quartet and listed in the line for the *AA* sublevel. The definition of the line strengths and Einstein A can be found in earlier reviews in this series, for example see Kirchhoff et al. [12].

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[1] Figures in brackets indicate literature references.

As a convenience to the user, the calculated and observed transitions from table 5 are listed according to increasing frequency in table 7. The spin weights and relative intensities are also listed after the quantum numbers and symmetry species labels.

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)

I_a, I_b, I_c — Moments of inertia in the principal axes system (uÅ^2).

$g = a, b, c$ — Principal inertia axes

I_α — Moment of inertia of the methyl top around internal rotation axis (uÅ^2).

α_i — Torsion angle of methyl top i, $i = 1,2$

ρ — Internal rotation parameter
$\rho = [\sum_g (\lambda_{gi} I_\alpha / I_g)^2]^{1/2}$

λ_{gi} — Direction cosines between the internal rotation axis i and inertia axis g.

$\angle(g,i)$ — Angle between internal rotation axis i and inertia axis g.

Δ_o — Internal rotation interaction constant (MHz)
$\Delta_o = 3F a_1(s)/2 = \frac{27}{8} F\omega_1(s)$ [13,14]

F — Internal rotation constant (MHz) in the one top approximation
$F = h/8\pi^2 r I$

r — $r = 1 - \sum_g \lambda_g{}^2 I_\alpha / I_g$

β — Second Eulerian angle for the transformation from the principal axes system to the internal rotation axes system $\beta = \arc\cos(\lambda_a I_\alpha / I_a \rho)$

V_3 — Threefold component of torsional barrier potential for one top (cal/mol) (barrier height)
$V(\alpha_i) = \frac{V_3}{2}(1\text{-}\cos 3\alpha_i)$

s — Reduced barrier height
$s = \frac{4}{9}\frac{V_3}{F}$

$a_1(s)$ — Fourier coefficient [15]
$a_1(s) = \frac{9}{4}\omega_1(s)$

$\omega_1(s)$ — Fourier coefficient [16–18]

κ — $\kappa = \frac{2B\text{-}A\text{-}C}{A\text{-}C}$

P_g — g-component of total angular momentum

p_i — Total angular momentum of top i along its symmetry axis, $i = 1,2$

$\mathscr{P}_i$ — $\mathscr{P}_i = \sum_g \lambda_{gi} P_g / I_g$, $i = 1,2$

AA, EE, AE, EA = A_1A_1, EE, A_1E, EA_1
Symmetry species of invariance group $C_{3v}^- \otimes C_{3v}^+$ [19,20] of the Hamiltonian (1)

b. Conversion Factors

$A \cdot I_a = 5.0537905(85) \times 10^5$ MHz·u·Å^2,
$h = 6.626176(36) \times 10^{-34}$ J·s,
$c = 2.99792458(1) \times 10^8$ m·s^{-1}
1 cm^{-1} ≙ $1.986478(11) \times 10^{-23}$ J,
≙ 11.96266 J·mol^{-1},
1 u = $1.660565(86) \times 10^{-27}$ kg,
1 Å = 10^{-10} m.

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3. Dimethyl Ether Spectral Tables.

Table 1. Rotational and centrifugal distortion constants for the AA torsional sublevel for $^{12}CH_3{}^{16}O^{12}CH_3$ from the present analysis.

Parameter	Constants determined from fit[b] (MHz)	Parameter	Derived constants[b] (MHz)
A"	38 789.3953(109)	A'	38 789.377(11)
B"	10 056.5381(29)	B'	10 056.523(3)
C"	8 886.80566(278)	C'	8 886.836(3)
τ_1	-0.005843(633)	τ_{bbcc}	-0.036478(44)
τ_2	-0.020397(134)	τ_{ccaa}	-0.02981(87)
τ_3[a]	1.62(2)	τ_{aabb}	0.06045(50)
τ_{aaaa}	-1.3574(10)		
τ_{bbbb}	-0.050720(51)		
τ_{cccc}	-0.022237(38)		
σ	0.088		

Correlation Matrix

	A"	B"	C"	τ_1	τ_2	τ_3	τ_{aaaa}	τ_{bbbb}	τ_{cccc}
A"	1.0								
B"	0.8213	1.0							
C"	0.8381	0.8909	1.0						
τ_1	-0.4858	-0.5892	-0.4794	1.0					
τ_2	-0.5007	-0.6064	-0.5016	0.9977	1.0				
τ_3	0.3250	0.3753	0.3449	-0.1625	-0.1267	1.0			
τ_{aaaa}	-0.7336	-0.4378	-0.4291	0.4855	0.5019	-0.1932	1.0		
τ_{bbbb}	-0.5647	-0.7251	-0.5486	0.9454	0.9475	-0.3335	0.5510	1.0	
τ_{cccc}	-0.6426	-0.7013	-0.7339	0.8919	0.8973	-0.3822	0.5643	0.8880	1.0

[a] Value fixed through setting R_6=0. See discussion by Kirchhoff (ref. 1 in section 2.4.)

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

Table 2. Internal rotation constants for the ground torsional level of $^{12}CH_3{}^{16}O^{12}CH_3$ from the present analysis.[a]

Assumed Parameters [63A]		Fitted Parameters	
A	= 38 788.5 MHz	$\angle(a,i)$	= 32.206(10)
B	= 10 056.6 MHz	$\omega_1(s)$	= $-0.14364(80)\times10^{-4}$
C	= 8 886.9 MHz		
I_α	= 3.2074 u·Å^2		

Correlation Matrix

	Set 1		Set 2	
$\angle(a,i)$	1.0		1.0	
$\omega_1(s)$	0.42	1.0	0.77	1.0
$\Delta\nu$[b]	3.0 MHz		4.2 MHz	
σ[c]	0.2 MHz		0.4 MHz	

Derived Parameters

$\angle(b,i)$	= 57.794(10)°	β	= 9.275(40)°
F	= 195.5826(40) MHz	ρ	= 0.211057(20)
s	= 61.57(5)	Δ_0	= 9.482(50) MHz
V_3	= 2583(20) cal/mole	$\lvert\lambda_{ai}\rvert$	= 0.84614(10)
κ	= -0.921763	$\lvert\lambda_{bi}\rvert$	= 0.53296(10)

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

[b] Mean of splittings.

[c] Mean square deviation.

Table 3. Effective rigid-rotor rotational constants for $^{12}CH_3O^{12}CH_3$ in excited torsional states and the ^{13}C, ^{18}O and deuterated isotopic forms of dimethyl ether in the ground and lowest torsional states.

Isotopic Species	$\tilde{v}_n$ [a]	A (MHz)	B (MHz)	C (MHz)	Reference
CH_3OCH_3 [b]	1_1	38 797.34(30)	10 024.95(5)	8 867.34(10)	[78A]
	1_2	38 770.43(30)	9 993.07(5)	8 870.13(10)	[78A]
	2_1	39 394.67(44)	10 003.35(9)	8 851.08(13)	[78A]
	2_2	39 571.26(17)	9 984.53(4)	8 879.56(5)	[78A]
	2_3	39 131.42(32)	9 946.58(6)	8 852.25(9)	[78A]
$^{13}CH_3O^{12}CH_3$ [c]	0_1	38 615.6(10)	9 795.6(5)	8 673.5(5)	[63A]
$CH_3{}^{18}OCH_3$ [c]	0_1	37 172.1(10)	10 058.2(5)	8 799.4(5)	[63A]
s-CH_2DOCH_3 [c]	0^e	38 281.6(10)	9 309.1(5)	8 277.9(5)	[63A]
a-CH_2DOCH_3 [c]	0^e	34 764.1(10)	9 642.3(5)	8 537.2(5)	[63A]
CD_3OCH_3	0_1	30 912.15(50)	8 635.50(15)	7 747.45(20)	d
	1_1	30 911.09(7)	8 609.50(2)	7 736.91(2)	d
	1_2	30 904.07(10)	8 590.73(3)	7 733.92(4)	d
CD_3OCD_3 [b]	0_1	25 696.17(11)	7 483.79(3)	6 798.01(6)	[75B,78A]
	1_1	25 701.73(9)	7 466.97(3)	6 785.67(5)	[75B,78A]
	1_2	25 674.80(9)	7 448.76(3)	6 793.73(5)	[75B,78A]
	2_1	25 723.78(8)	7 448.79(2)	6 772.76(3)	[78A]
	2_2	25 697.70(8)	7 433.62(2)	6 776.71(3)	[78A]
	2_3	25 728.74(6)	7 427.18(2)	6 783.64(2)	[78A]

[a] $\tilde{v}_n = 0_1$ corresponds to $v_1,v_2 = (0,0)$, $\tilde{v}_n = 1_1$ and 1_2 corresponds to $v_1,v_2 = (0,1)$ and $(1,0)$ respectively where increasing values of n for a value of $\tilde{v}$ indicate increasing energy for the torsional states.

[b] Effective rigid rotor rotational constants for the AA sublevel.

[c] Effective rigid rotor rotational constants from a fit to three low J transitions for the EE torsional sublevel. Measurements for the AA, AE and EA sublevels were not reported in reference [63A].

[d] Rigid rotor fit to the transitions with $J \leq 4$ for the $A \leftrightarrow B$ torsional sublevels (Γ = 00+ or 00-) reported in reference [76C].

[e] Ground state, v=0, for a symmetric top-asymmetric top molecule.

Table 4. Other molecular constants for dimethyl ether.

Structure [63A]			
r_{CO}	1.410(3) Å	$\angle COC$	111.72(33)°
r_{CH_a}	1.100(5) Å	$\angle OCH_a$	110.83(33)°
r_{CH_s}	1.091(7) Å	$\angle OCH_s$	107.23(58)°
		$\angle H_aCH_a$	108.73(50)°
2Θ[a]	116.77(67)°	$\angle H_aCH_s$	109.55(58)°
Dipole Moment [63A]			
$\mu_b(^{12}CH_3O^{12}CH_3)$	1.302(1) D		

[a] Twice the angle between the methyl group axis and the b-principal axis.

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
1(1, 1) - 0(0, 0)	AA		47675.85(2)	6	1.0	1.000	0.00	
1(1, 1) - 0(0, 0)	EE		47674.95(1)	16	1.0			
1(1, 1) - 0(0, 0)	EA		47674.05(2)	2	1.0			
1(1, 1) - 0(0, 0)	AE		47674.07(2)	4	1.0			
1(1, 0) - 1(0, 1)	AA	29902.288(30)	29902.26(1)	10	1.0	1.500	0.63	
1(1, 0) - 1(0, 1)	EE	29901.400(30)	29901.37(1)	16	1.0			
1(1, 0) - 1(0, 1)	EA	29900.480(30)	29900.50(2)	4	1.0			
1(1, 0) - 1(0, 1)	AE	29900.480(30)	29900.48(2)	6	1.0			
2(2, 0) - 1(1, 1)	AA		126454.60(6)	16	1.0	1.470	1.59	
2(2, 0) - 1(1, 1)	EE		126452.57(2)	16	0.99			
2(2, 0) - 1(1, 1)	EA		126451.48(2)	2	0.95			
2(2, 0) - 1(1, 1)	AE		126449.55(6)	4	1.0			
2(0, 2) - 1(1, 1)	AA	9118.818(30)	9118.90(1)	6	1.0	0.530	1.59	[76A]
2(0, 2) - 1(1, 1)	EE	9119.670(15)	9119.74(1)	16	1.0			[76A]
2(0, 2) - 1(1, 1)	EA	9120.517(15)	9120.58(3)	4	1.0			[76A]
2(0, 2) - 1(1, 1)	AE	9120.517(15)	9120.56(3)	2	1.0			[76A]
2(1, 2) - 1(0, 1)	AA	65449.40 (5)	65449.38(3)	10	1.0	1.500	0.63	
2(1, 2) - 1(0, 1)	EE	65448.50 (5)	65448.49(1)	16	1.0			
2(1, 2) - 1(0, 1)	EA	65447.62 (5)	65447.60(2)	4	1.0			
2(1, 2) - 1(0, 1)	AE	65447.62 (5)	65447.60(2)	6	1.0			
2(2, 1) - 1(1, 0)	AA		125249.88(6)	10	1.0	1.500	1.63	
2(2, 1) - 1(1, 0)	EE		125246.88(4)	16	0.99			
2(2, 1) - 1(1, 0)	EA		125242.95(12)	4	0.95			
2(2, 1) - 1(1, 0)	AE		125244.87(7)	6	1.0			
2(1, 1) - 2(0, 2)	AA	31107.12 (10)	31107.04(1)	6	1.0	2.450	1.89	[74A]
2(1, 1) - 2(0, 2)	EE	31106.20 (5)	31106.13(1)	16	1.0			[74A]
2(1, 1) - 2(0, 2)	EA	31105.26 (10)	31105.23(2)	4	1.0			[74A]
2(1, 1) - 2(0, 2)	AE	31105.26 (10)	31105.23(2)	2	1.0			[74A]
2(2, 0) - 2(1, 1)	AA	86228.72 (12)	86228.67(4)	6	1.0	0.884	2.93	[74A]
2(2, 0) - 2(1, 1)	EE	86226.73 (10)	86226.72(2)	16	0.99			[79A]
2(2, 0) - 2(1, 1)	EA	86225.67 (12)	86225.67(3)	4	0.95			[74A]
2(2, 0) - 2(1, 1)	AE	86223.76 (10)	86223.77(8)	2	1.0			[79A]
2(2, 1) - 2(1, 2)	AA	89702.81 (9)	89702.76(4)	10	1.0	0.833	2.82	[74A]
2(2, 1) - 2(1, 2)	EE	89699.81 (9)	89699.76(4)	16	0.99			[74A]
2(2, 1) - 2(1, 2)	EA	89695.88 (9)	89695.85(11)	4	0.95			[79A]
2(2, 1) - 2(1, 2)	AE	89697.71 (9)	89697.74(7)	6	1.0			[79A]
3(2, 1) - 2(1, 2)	AA		146707.23(7)	10	1.0	1.566	2.82	
3(2, 1) - 2(1, 2)	EE		146704.79(2)	16	1.0			
3(2, 1) - 2(1, 2)	EA		146702.54(5)	4	1.0			
3(2, 1) - 2(1, 2)	AE		146702.14(6)	6	1.0			
3(3, 0) - 2(2, 1)	AA		203418.82(9)	10	1.0	2.487	5.81	
3(3, 0) - 2(2, 1)	EE		203420.63(3)	16	0.41			
3(3, 0) - 2(2, 1)	EA		203423.66(8)	4	0.30			
3(3, 0) - 2(2, 1)	AE		203411.52(10)	6	1.0			
3(0, 3) - 2(1, 2)	AA	29091.33 (5)	29091.39(2)	10	1.0	1.100	2.82	
3(0, 3) - 2(1, 2)	EE	29092.12 (5)	29092.18(2)	16	1.0			
3(0, 3) - 2(1, 2)	EA	29092.92 (5)	29092.97(4)	4	1.0			
3(0, 3) - 2(1, 2)	AE	29092.92 (5)	29092.97(4)	6	1.0			
2(2, 1) - 3(1, 2)	AA	27632.296(30)	27632.22(3)	10	1.0	0.180	4.89	
2(2, 1) - 3(1, 2)	EE	27629.432(30)	27629.36(6)	16	0.99			
2(2, 1) - 3(1, 2)	EA	27625.76 (5)	27625.59(14)	4	0.95			
2(2, 1) - 3(1, 2)	AE	27627.56 (5)	27627.49(9)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
3(3, 1) - 2(2, 0)	AA		203383.17(9)	6	1.0	2.487	5.81	
3(3, 1) - 2(2, 0)	EE		203374.07(13)	16	0.41			
3(3, 1) - 2(2, 0)	EA		203363.74(28)	2	0.30			
3(3, 1) - 2(2, 0)	AE		203375.87(10)	4	1.0			
3(1, 3) - 2(0, 2)	AA	82651.08 (10)	82651.22(4)	6	1.0	2.020	1.89	[79A]
3(1, 3) - 2(0, 2)	EE	82650.18 (10)	82650.35(1)	16	1.0			[79A]
3(1, 3) - 2(0, 2)	EA	82649.30 (10)	82649.47(3)	4	1.0			[79A]
3(1, 3) - 2(0, 2)	AE	82649.30 (10)	82649.47(3)	2	1.0			[79A]
3(2, 2) - 2(1, 1)	AA		143023.39(7)	6	1.0	1.667	2.93	
3(2, 2) - 2(1, 1)	EE		143020.81(4)	16	1.0			
3(2, 2) - 2(1, 1)	EA		143018.02(8)	2	1.0			
3(2, 2) - 2(1, 1)	AE		143018.42(7)	4	1.0			
2(2, 0) - 3(1, 3)	AA	34684.63 (5)	34684.49(3)	6	1.0	0.159	4.65	
2(2, 0) - 3(1, 3)	EE	34682.59 (5)	34682.50(2)	16	1.0			
2(2, 0) - 3(1, 3)	EA	34681.45 (5)	34681.43(2)	4	1.0			
2(2, 0) - 3(1, 3)	AE	34679.60 (5)	34679.53(7)	2	1.0			
3(3, 0) - 3(2, 1)	AA		146414.35(6)	10	1.0	0.897	7.71	
3(3, 0) - 3(2, 1)	EE		146415.60(2)	16	0.56			
3(3, 0) - 3(2, 1)	EA		146416.96(4)	4	0.56			
3(3, 0) - 3(2, 1)	AE		146407.13(11)	6	1.0			
3(1, 2) - 3(0, 3)	AA	32979.24 (10)	32979.15(1)	10	1.0	3.324	3.79	
3(1, 2) - 3(0, 3)	EE	32978.29 (5)	32978.22(1)	16	1.0			
3(1, 2) - 3(0, 3)	EA	32977.34 (14)	32977.29(3)	4	1.0			
3(1, 2) - 3(0, 3)	AE	32977.34 (14)	32977.29(3)	6	1.0			
3(2, 1) - 3(1, 2)	AA	84636.80 (10)	84636.69(4)	10	1.0	1.612	4.89	[79A]
3(2, 1) - 3(1, 2)	EE	84634.40 (10)	84634.39(4)	16	1.0			[79A]
3(2, 1) - 3(1, 2)	EA	84632.02 (10)	84632.28(7)	4	1.0			[79A]
3(2, 1) - 3(1, 2)	AE	84632.02 (10)	84631.89(9)	6	1.0			[79A]
3(2, 2) - 3(1, 3)	AA	91479.31 (23)	91479.21(4)	6	1.0	1.437	4.65	[74A]
3(2, 2) - 3(1, 3)	EE	91476.53 (18)	91476.59(3)	16	1.0			[74A]
3(2, 2) - 3(1, 3)	EA	91473.82 (23)	91473.78(7)	4	1.0			[74A]
3(2, 2) - 3(1, 3)	AE	91473.82 (23)	91474.17(6)	2	1.0			[74A]
3(3, 1) - 3(2, 2)	AA		146588.45(6)	6	1.0	0.897	7.70	
3(3, 1) - 3(2, 2)	EE		146579.98(12)	16	0.56			
3(3, 1) - 3(2, 2)	EA		146571.39(23)	2	0.56			
3(3, 1) - 3(2, 2)	AE		146581.23(11)	4	1.0			
4(4, 0) - 3(3, 1)	AA		280943.85(10)	6	1.0	3.488	12.59	
4(4, 0) - 3(3, 1)	EE		280950.08(8)	16	0.00			
4(4, 0) - 3(3, 1)	EA		280956.61(16)	2	0.00			
4(4, 0) - 3(3, 1)	AE		280935.66(11)	4	1.0			
4(2, 2) - 3(1, 3)	AA		167746.63(7)	6	1.0	1.660	4.65	
4(2, 2) - 3(1, 3)	EE		167744.09(3)	16	1.0			
4(2, 2) - 3(1, 3)	EA		167741.62(7)	2	1.0			
4(2, 2) - 3(1, 3)	AE		167741.49(7)	4	1.0			
4(3, 1) - 3(2, 2)	AA		222434.08(9)	6	1.0	2.584	7.70	
4(3, 1) - 3(2, 2)	EE		222433.96(1)	16	0.68			
4(3, 1) - 3(2, 2)	EA		222435.63(4)	2	0.56			
4(3, 1) - 3(2, 2)	AE		222426.82(10)	4	1.0			
3(3, 1) - 4(2, 2)	AA		70321.03(4)	6	1.0	0.127	10.25	
3(3, 1) - 4(2, 2)	EE		70312.48(13)	16	0.52			
3(3, 1) - 4(2, 2)	EA		70303.56(26)	2	0.50			
3(3, 1) - 4(2, 2)	AE		70313.91(12)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
4(0, 4) - 3(1, 3)	AA		49461.23(3)	6	1.0	1.725	4.65	
4(0, 4) - 3(1, 3)	EE		49461.97(2)	16	1.0			
4(0, 4) - 3(1, 3)	EA		49462.70(5)	2	1.0			
4(0, 4) - 3(1, 3)	AE		49462.70(5)	4	1.0			
3(2, 2) - 4(1, 3)	AA		6423.60(3)	6	1.0	0.416	7.49	
3(2, 2) - 4(1, 3)	EE		6421.21(5)	16	1.0			
3(2, 2) - 4(1, 3)	EA		6418.62(12)	2	1.0			
3(2, 2) - 4(1, 3)	AE		6419.02(11)	4	1.0			
4(3, 2) - 3(2, 1)	AA		222254.74(9)	10	1.0	2.586	7.71	
4(3, 2) - 3(2, 1)	EE		222247.60(12)	16	0.68			
4(3, 2) - 3(2, 1)	EA		222238.67(26)	4	0.56			
4(3, 2) - 3(2, 1)	AE		222247.48(10)	6	1.0			
4(1, 4) - 3(0, 3)	AA	99326.00 (20)	99326.09(5)	10	1.0	2.574	3.79	
4(1, 4) - 3(0, 3)	EE	99325.25 (20)	99325.24(1)	16	1.0			
4(1, 4) - 3(0, 3)	EA	99324.43 (20)	99324.40(3)	4	1.0			
4(1, 4) - 3(0, 3)	AE	99324.43 (20)	99324.40(3)	6	1.0			
4(4, 1) - 3(3, 0)	AA		280943.18(10)	10	1.0	3.488	12.59	
4(4, 1) - 3(3, 0)	EE		280928.76(19)	16	0.00			
4(4, 1) - 3(3, 0)	EA		280914.04(38)	4	0.00			
4(4, 1) - 3(3, 0)	AE		280934.98(11)	6	1.0			
4(2, 3) - 3(1, 2)	AA		160206.62(7)	10	1.0	1.885	4.89	
4(2, 3) - 3(1, 2)	EE		160204.13(4)	16	1.0			
4(2, 3) - 3(1, 2)	EA		160201.58(8)	4	1.0			
4(2, 3) - 3(1, 2)	AE		160201.71(8)	6	1.0			
3(2, 1) - 4(1, 4)	AA		18289.75(3)	10	1.0	0.339	7.10	
3(2, 1) - 4(1, 4)	EE		18287.36(3)	16	1.0			
3(2, 1) - 4(1, 4)	EA		18285.17(6)	4	1.0			
3(2, 1) - 4(1, 4)	AE		18284.77(7)	6	1.0			
3(3, 0) - 4(2, 3)	AA		70844.42(4)	10	1.0	0.127	10.23	
3(3, 0) - 4(2, 3)	EE		70845.85(3)	16	0.52			
3(3, 0) - 4(2, 3)	EA		70847.66(7)	4	0.50			
3(3, 0) - 4(2, 3)	AE		70837.30(12)	6	1.0			
4(3, 1) - 4(2, 2)	AA		146166.65(6)	10	1.0	1.626	10.25	
4(3, 1) - 4(2, 2)	EE		146166.46(2)	16	0.71			
4(3, 1) - 4(2, 2)	EA		146167.78(5)	4	0.62			
4(3, 1) - 4(2, 2)	AE		146159.49(11)	6	1.0			
4(1, 3) - 4(0, 4)	AA	35594.39 (10)	35594.38(2)	6	1.0	4.094	6.30	
4(1, 3) - 4(0, 4)	EE	35593.409(50)	35593.42(1)	16	1.0			
4(1, 3) - 4(0, 4)	EA	35592.40 (10)	35592.45(3)	4	1.0			
4(1, 3) - 4(0, 4)	AE	35592.40 (10)	35592.45(3)	2	1.0			
4(4, 0) - 4(3, 1)	AA		205098.22(7)	6	1.0	0.921	15.12	
4(4, 0) - 4(3, 1)	EE		205096.09(5)	16	0.96			
4(4, 0) - 4(3, 1)	EA		205092.37(12)	2	0.99			
4(4, 0) - 4(3, 1)	AE		205090.06(11)	4	1.0			
4(2, 2) - 4(1, 3)	AA	82691.14 (10)	82691.03(4)	6	1.0	2.357	7.49	[79A]
4(2, 2) - 4(1, 3)	EE	82688.77 (10)	82688.72(4)	16	1.0			[79A]
4(2, 2) - 4(1, 3)	EA	82686.50 (10)	82686.47(9)	4	1.0			[79A]
4(2, 2) - 4(1, 3)	AE	82686.50 (10)	82686.34(10)	2	1.0			[79A]
4(4, 1) - 4(3, 2)	AA		205102.80(7)	10	1.0	0.921	15.12	
4(4, 1) - 4(3, 2)	EE		205096.78(6)	16	0.96			
4(4, 1) - 4(3, 2)	EA		205092.34(10)	4	0.99			
4(4, 1) - 4(3, 2)	AE		205094.64(11)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
4(2, 3) – 4(1, 4)	*AA*	93859.64 (10)	93859.68(4)	10	1.0	1.956	7.10	
4(2, 3) – 4(1, 4)	*EE*	93857.11 (10)	93857.11(3)	16	1.0			
4(2, 3) – 4(1, 4)	*EA*	93854.44 (10)	93854.47(7)	4	1.0			
4(2, 3) – 4(1, 4)	*AE*	93854.44 (10)	93854.60(6)	6	1.0			
4(3, 2) – 4(2, 3)	*AA*		146684.81(6)	6	1.0	1.623	10.25	
4(3, 2) – 4(2, 3)	*EE*		146677.85(12)	16	0.71			
4(3, 2) – 4(2, 3)	*EA*		146669.37(25)	2	0.62			
4(3, 2) – 4(2, 3)	*AE*		146677.65(11)	4	1.0			
5(4, 1) – 4(3, 2)	*AA*		299897.07(11)	10	1.0	3.564	15.12	
5(4, 1) – 4(3, 2)	*EE*		299901.70(7)	16	0.04			
5(4, 1) – 4(3, 2)	*EA*		299907.95(17)	4	0.01			
5(4, 1) – 4(3, 2)	*AE*		299888.96(11)	6	1.0			
5(2, 3) – 4(1, 4)	*AA*		189708.13(8)	10	1.0	1.716	7.10	
5(2, 3) – 4(1, 4)	*EE*		189705.54(4)	16	1.0			
5(2, 3) – 4(1, 4)	*EA*		189702.97(8)	4	1.0			
5(2, 3) – 4(1, 4)	*AE*		189702.92(8)	6	1.0			
5(3, 2) – 4(2, 3)	*AA*		241531.18(10)	10	1.0	2.720	10.23	
5(3, 2) – 4(2, 3)	*EE*		241528.97(1)	16	0.93			
5(3, 2) – 4(2, 3)	*EA*		241528.76(1)	4	0.82			
5(3, 2) – 4(2, 3)	*AE*		241523.98(10)	6	1.0			
4(3, 2) – 5(2, 3)	*AA*		50836.36(4)	10	1.0	0.305	13.43	
4(3, 2) – 5(2, 3)	*EE*		50829.42(13)	16	0.71			
4(3, 2) – 5(2, 3)	*EA*		50820.87(28)	4	0.61			
4(3, 2) – 5(2, 3)	*AE*		50829.34(13)	6	1.0			
5(0, 5) – 4(1, 4)	*AA*		70118.93(3)	10	1.0	2.414	7.10	
5(0, 5) – 4(1, 4)	*EE*		70119.60(2)	16	1.0			
5(0, 5) – 4(1, 4)	*EA*		70120.27(5)	4	1.0			
5(0, 5) – 4(1, 4)	*AE*		70120.27(5)	6	1.0			
4(4, 1) – 5(3, 2)	*AA*		110256.42(5)	10	1.0	0.102	18.29	
4(4, 1) – 5(3, 2)	*EE*		110245.65(16)	16	0.26			
4(4, 1) – 5(3, 2)	*EA*		110232.94(37)	4	0.12			
4(4, 1) – 5(3, 2)	*AE*		110248.31(12)	6	1.0			
5(1, 4) – 4(2, 3)	*AA*		15307.58(3)	10	1.0	0.689	10.23	
5(1, 4) – 4(2, 3)	*EE*		15309.81(6)	16	1.0			
5(1, 4) – 4(2, 3)	*EA*		15312.12(13)	4	1.0			
5(1, 4) – 4(2, 3)	*AE*		15311.99(12)	6	1.0			
5(3, 3) – 4(2, 2)	*AA*		240990.14(10)	6	1.0	2.726	10.25	
5(3, 3) – 4(2, 2)	*EE*		240985.15(9)	16	0.93			
5(3, 3) – 4(2, 2)	*EA*		240978.15(23)	2	0.82			
5(3, 3) – 4(2, 2)	*AE*		240982.94(11)	4	1.0			
5(1, 5) – 4(0, 4)	*AA*		115545.65(6)	6	1.0	3.177	6.30	
5(1, 5) – 4(0, 4)	*EE*	115544.62 (10)	115544.84(2)	16	1.0			
5(1, 5) – 4(0, 4)	*EA*		115544.03(4)	4	1.0			
5(1, 5) – 4(0, 4)	*AE*		115544.03(4)	2	1.0			
5(4, 2) – 4(3, 1)	*AA*		299892.40(11)	6	1.0	3.564	15.12	
5(4, 2) – 4(3, 1)	*EE*		299879.67(19)	16	0.04			
5(4, 2) – 4(3, 1)	*EA*		299865.31(40)	2	0.01			
5(4, 2) – 4(3, 1)	*AE*		299884.29(11)	4	1.0			
5(2, 4) – 4(1, 3)	*AA*		176803.76(8)	6	1.0	2.133	7.49	
5(2, 4) – 4(1, 3)	*EE*		176801.34(4)	16	1.0			
5(2, 4) – 4(1, 3)	*EA*		176798.89(9)	2	1.0			
5(2, 4) – 4(1, 3)	*AE*		176798.95(9)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
4(4, 0) - 5(3, 3)	*AA*		110274.74(5)	6	1.0	0.102	18.29	
4(4, 0) - 5(3, 3)	*EE*		110277.41(5)	16	0.26			
4(4, 0) - 5(3, 3)	*EA*		110282.01(12)	2	0.13			
4(4, 0) - 5(3, 3)	*AE*		110266.63(12)	4	1.0			
4(2, 2) - 5(1, 5)	*AA*		2739.75(3)	6	1.0	0.503	10.16	
4(2, 2) - 5(1, 5)	*EE*		2737.28(3)	16	1.0			
4(2, 2) - 5(1, 5)	*EA*		2734.88(6)	2	1.0			
4(2, 2) - 5(1, 5)	*AE*		2734.75(6)	4	1.0			
4(3, 1) - 5(2, 4)	*AA*		52053.92(3)	6	1.0	0.303	13.39	
4(3, 1) - 5(2, 4)	*EE*		52053.83(2)	16	0.70			
4(3, 1) - 5(2, 4)	*EA*		52055.36(6)	2	0.60			
4(3, 1) - 5(2, 4)	*AE*		52046.89(12)	4	1.0			
5(5, 0) - 5(4, 1)	*AA*		263662.59(11)	10	1.0	0.937	25.13	
5(5, 0) - 5(4, 1)	*EE*		263657.98(6)	16	1.0			
5(5, 0) - 5(4, 1)	*EA*		263653.33(14)	4	1.0			
5(5, 0) - 5(4, 1)	*AE*		263655.01(9)	6	1.0			
5(3, 2) - 5(2, 3)	*AA*		145682.73(6)	10	1.0	2.292	13.43	
5(3, 2) - 5(2, 3)	*EE*		145680.54(2)	16	0.94			
5(3, 2) - 5(2, 3)	*EA*		145680.26(2)	4	0.84			
5(3, 2) - 5(2, 3)	*AE*		145675.66(12)	6	1.0			
5(1, 4) - 5(0, 5)	*AA*	39048.33 (3)	39048.33(2)	10	1.0	4.733	9.44	
5(1, 4) - 5(0, 5)	*EE*	39047.26 (3)	39047.32(2)	16	1.0			
5(1, 4) - 5(0, 5)	*EA*	39046.26 (3)	39046.31(5)	4	1.0			
5(1, 4) - 5(0, 5)	*AE*	39046.26 (3)	39046.31(5)	6	1.0			
5(4, 1) - 5(3, 2)	*AA*		205050.70(7)	6	1.0	1.696	18.29	
5(4, 1) - 5(3, 2)	*EE*		205050.57(2)	16	0.75			
5(4, 1) - 5(3, 2)	*EA*		205048.55(9)	2	0.88			
5(4, 1) - 5(3, 2)	*AE*		205042.64(12)	4	1.0			
5(2, 3) - 5(1, 4)	*AA*	80540.88 (10)	80540.87(4)	10	1.0	3.169	10.74	[79A]
5(2, 3) - 5(1, 4)	*EE*	80538.54 (10)	80538.62(5)	16	1.0			[79A]
5(2, 3) - 5(1, 4)	*EA*	80536.24 (10)	80536.39(10)	4	1.0			[79A]
5(2, 3) - 5(1, 4)	*AE*	80536.24 (10)	80536.33(10)	6	1.0			[79A]
5(4, 2) - 5(3, 3)	*AA*		205068.91(7)	6	1.0	1.696	18.29	
5(4, 2) - 5(3, 3)	*EE*		205060.98(9)	16	0.75			
5(4, 2) - 5(3, 3)	*EA*		205054.94(15)	2	0.88			
5(4, 2) - 5(3, 3)	*AE*		205060.85(12)	4	1.0			
5(2, 4) - 5(1, 5)	*AA*	96852.46 (10)	96852.48(4)	6	1.0	2.420	10.16	[79A]
5(2, 4) - 5(1, 5)	*EE*	96849.85 (10)	96849.91(3)	16	1.0			[79A]
5(2, 4) - 5(1, 5)	*EA*	96847.25 (10)	96847.30(7)	4	1.0			[79A]
5(2, 4) - 5(1, 5)	*AE*	96847.25 (10)	96847.36(6)	2	1.0			[79A]
5(5, 1) - 5(4, 2)	*AA*		263662.68(11)	6	1.0	0.937	25.13	
5(5, 1) - 5(4, 2)	*EE*		263659.70(4)	16	1.0			
5(5, 1) - 5(4, 2)	*EA*		263656.77(9)	2	1.0			
5(5, 1) - 5(4, 2)	*AE*		263655.10(9)	4	1.0			
5(3, 3) - 5(2, 4)	*AA*		146877.41(6)	6	1.0	2.280	13.39	
5(3, 3) - 5(2, 4)	*EE*		146872.52(9)	16	0.94			
5(3, 3) - 5(2, 4)	*EA*		146865.73(23)	2	0.84			
5(3, 3) - 5(2, 4)	*AE*		146870.33(11)	4	1.0			
6(2, 4) - 5(1, 5)	*AA*		212752.08(9)	6	1.0	1.723	10.16	
6(2, 4) - 5(1, 5)	*EE*		212749.44(5)	16	1.0			
6(2, 4) - 5(1, 5)	*EA*		212746.82(10)	2	1.0			
6(2, 4) - 5(1, 5)	*AE*		212746.79(10)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
6(3, 3) - 5(2, 4)	*AA*		260761.70(10)	6	1.0	2.867	13.39	
6(3, 3) - 5(2, 4)	*EE*		260758.61(4)	16	0.99			
6(3, 3) - 5(2, 4)	*EA*		260756.45(5)	2	0.97			
6(3, 3) - 5(2, 4)	*AE*		260754.56(11)	4	1.0			
5(5, 1) - 6(4, 2)	*AA*		149886.14(10)	6	1.0	0.085	28.92	
5(5, 1) - 6(4, 2)	*EE*		149872.88(17)	16	1.0			
5(5, 1) - 6(4, 2)	*EA*		149859.39(35)	2	1.0			
5(5, 1) - 6(4, 2)	*AE*		149878.53(9)	4	1.0			
5(3, 3) - 6(2, 4)	*AA*	30977.816(30)	30977.81(4)	6	1.0	0.507	17.25	
5(3, 3) - 6(2, 4)	*EE*	30973.168(30)	30972.99(11)	16	0.94			
5(3, 3) - 6(2, 4)	*EA*	30966.568(50)	30966.21(26)	4	0.83			
5(3, 3) - 6(2, 4)	*AE*	30971.000(50)	30970.90(14)	2	1.0			
6(0, 6) - 5(1, 5)	*AA*	90937.539(40)	90937.64(4)	6	1.0	3.177	10.16	[74A,79A]
6(0, 6) - 5(1, 5)	*EE*	90938.099(30)	90938.24(3)	16	1.0			[74A,79A]
6(0, 6) - 5(1, 5)	*EA*	90938.674(50)	90938.84(6)	4	1.0			[74A,79A]
6(0, 6) - 5(1, 5)	*AE*	90938.674(50)	90938.84(6)	2	1.0			[74A,79A]
5(4, 2) - 6(3, 3)	*AA*	91184.48 (10)	91184.62(5)	6	1.0	0.254	22.08	
5(4, 2) - 6(3, 3)	*EE*	91175.25 (10)	91174.89(15)	16	0.41			
5(4, 2) - 6(3, 3)	*EA*		91164.22(33)	4	0.33			
5(4, 2) - 6(3, 3)	*AE*	91176.73 (10)	91176.62(13)	2	1.0			
6(1, 5) - 5(2, 4)	*AA*	37533.69 (3)	37533.83(4)	6	1.0	0.996	13.39	
6(1, 5) - 5(2, 4)	*EE*	37535.80 (3)	37535.94(7)	16	1.0			
6(1, 5) - 5(2, 4)	*EA*	37537.92 (3)	37538.09(14)	4	1.0			
6(1, 5) - 5(2, 4)	*AE*	37537.92 (3)	37538.03(14)	2	1.0			
6(3, 4) - 5(2, 3)	*AA*		259493.92(10)	10	1.0	2.883	13.43	
6(3, 4) - 5(2, 3)	*EE*		259489.87(7)	16	0.99			
6(3, 4) - 5(2, 3)	*EA*		259484.90(18)	4	0.97			
6(3, 4) - 5(2, 3)	*AE*		259486.79(12)	6	1.0			
6(1, 6) - 5(0, 5)	*AA*		131406.60(6)	10	1.0	3.838	9.44	
6(1, 6) - 5(0, 5)	*EE*		131405.84(2)	16	1.0			
6(1, 6) - 5(0, 5)	*EA*		131405.08(4)	4	1.0			
6(1, 6) - 5(0, 5)	*AE*		131405.08(4)	6	1.0			
6(2, 5) - 5(1, 4)	*AA*		192823.98(9)	10	1.0	2.407	10.74	
6(2, 5) - 5(1, 4)	*EE*		192821.63(5)	16	1.0			
6(2, 5) - 5(1, 4)	*EA*		192819.27(10)	4	1.0			
6(2, 5) - 5(1, 4)	*AE*		192819.29(10)	6	1.0			
5(4, 1) - 6(3, 4)	*AA*	91239.39 (10)	91239.51(5)	10	1.0	0.254	22.08	
5(4, 1) - 6(3, 4)	*EE*	91240.92 (10)	91241.24(3)	16	0.41			
5(4, 1) - 6(3, 4)	*EA*	91243.29 (10)	91243.92(8)	4	0.33			
5(4, 1) - 6(3, 4)	*AE*	91231.59 (10)	91231.51(13)	6	1.0			
6(1, 6) - 5(2, 3)	*AA*		11817.40(4)	10	1.0	0.635	13.43	
6(1, 6) - 5(2, 3)	*EE*		11819.90(3)	16	1.0			
6(1, 6) - 5(2, 3)	*EA*		11822.38(6)	4	1.0			
6(1, 6) - 5(2, 3)	*AE*		11822.43(6)	6	1.0			
5(5, 0) - 6(4, 3)	*AA*		149886.60(10)	10	1.0	0.085	28.92	
5(5, 0) - 6(4, 3)	*EE*		149892.25(8)	16	1.0			
5(5, 0) - 6(4, 3)	*EA*		149898.12(17)	4	1.0			
5(5, 0) - 6(4, 3)	*AE*		149878.99(9)	6	1.0			
5(3, 2) - 6(2, 5)	*AA*	33399.68 (5)	33399.62(3)	10	1.0	0.501	17.17	
5(3, 2) - 6(2, 5)	*EE*	33397.49 (5)	33397.53(2)	16	0.94			
5(3, 2) - 6(2, 5)	*EA*	33397.15 (5)	33397.38(4)	4	0.83			
5(3, 2) - 6(2, 5)	*AE*	33392.76 (5)	33392.70(13)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
6(5, 1) - 6(4, 2)	*AA*		263633.81(11)	6	1.0	1.746	28.92	
6(5, 1) - 6(4, 2)	*EE*		263629.45(7)	16	0.00			
6(5, 1) - 6(4, 2)	*EA*		263624.87(14)	2	0.00			
6(5, 1) - 6(4, 2)	*AE*		263626.34(10)	4	1.0			
6(3, 3) - 6(2, 4)	*AA*		144862.10(6)	6	1.0	2.935	17.25	
6(3, 3) - 6(2, 4)	*EE*		144859.07(5)	16	0.99			
6(3, 3) - 6(2, 4)	*EA*		144856.93(8)	2	0.97			
6(3, 3) - 6(2, 4)	*AE*		144855.12(14)	4	1.0			
6(1, 5) - 6(0, 6)	*AA*		43448.67(3)	6	1.0	5.225	13.19	
6(1, 5) - 6(0, 6)	*EE*		43447.61(3)	16	1.0			
6(1, 5) - 6(0, 6)	*EA*		43446.54(7)	2	1.0			
6(1, 5) - 6(0, 6)	*AE*		43446.54(7)	4	1.0			
6(4, 2) - 6(3, 3)	*AA*		204961.16(7)	6	1.0	2.397	22.08	
6(4, 2) - 6(3, 3)	*EE*		204961.72(1)	16	0.43			
6(4, 2) - 6(3, 3)	*EA*		204961.61(3)	2	0.34			
6(4, 2) - 6(3, 3)	*AE*		204953.19(13)	4	1.0			
6(2, 4) - 6(1, 5)	*AA*		78365.77(4)	6	1.0	4.067	14.64	
6(2, 4) - 6(1, 5)	*EE*		78363.59(5)	16	1.0			
6(2, 4) - 6(1, 5)	*EA*		78361.43(11)	2	1.0			
6(2, 4) - 6(1, 5)	*AE*		78361.40(11)	4	1.0			
6(4, 3) - 6(3, 4)	*AA*		205015.50(7)	10	1.0	2.397	22.08	
6(4, 3) - 6(3, 4)	*EE*		205006.98(13)	16	0.43			
6(4, 3) - 6(3, 4)	*EA*		204999.13(24)	4	0.34			
6(4, 3) - 6(3, 4)	*AE*		205007.53(13)	6	1.0			
6(2, 5) - 6(1, 6)	*AA*	100465.70 (10)	100465.71(4)	10	1.0	2.836	13.82	
6(2, 5) - 6(1, 6)	*EE*	100463.04 (10)	100463.11(3)	16	1.0			
6(2, 5) - 6(1, 6)	*EA*	100460.52 (10)	100460.51(7)	4	1.0			
6(2, 5) - 6(1, 6)	*AE*	100460.52 (10)	100460.53(7)	6	1.0			
6(5, 2) - 6(4, 3)	*AA*		263634.27(11)	10	1.0	1.746	28.92	
6(5, 2) - 6(4, 3)	*EE*		263631.15(4)	16	0.00			
6(5, 2) - 6(4, 3)	*EA*		263628.26(8)	4	0.00			
6(5, 2) - 6(4, 3)	*AE*		263626.80(10)	6	1.0			
6(3, 4) - 6(2, 5)	*AA*		147210.81(6)	10	1.0	2.905	17.17	
6(3, 4) - 6(2, 5)	*EE*		147206.86(7)	16	0.99			
6(3, 4) - 6(2, 5)	*EA*		147202.01(18)	4	0.97			
6(3, 4) - 6(2, 5)	*AE*		147203.83(12)	6	1.0			
7(2, 5) - 6(1, 6)	*AA*		237051.72(9)	10	1.0	1.676	13.82	
7(2, 5) - 6(1, 6)	*EE*		237049.03(6)	16	1.0			
7(2, 5) - 6(1, 6)	*EA*		237046.35(12)	4	1.0			
7(2, 5) - 6(1, 6)	*AE*		237046.34(12)	6	1.0			
7(3, 4) - 6(2, 5)	*AA*		280192.32(11)	10	1.0	3.010	17.17	
7(3, 4) - 6(2, 5)	*EE*		280188.98(5)	16	1.0			
7(3, 4) - 6(2, 5)	*EA*		280186.02(9)	4	1.0			
7(3, 4) - 6(2, 5)	*AE*		280185.26(12)	6	1.0			
6(5, 2) - 7(4, 3)	*AA*		130862.23(10)	10	1.0	0.218	33.35	
6(5, 2) - 7(4, 3)	*EE*		130849.69(19)	16	1.0			
6(5, 2) - 7(4, 3)	*EA*		130836.42(39)	4	1.0			
6(5, 2) - 7(4, 3)	*AE*		130854.71(10)	6	1.0			
6(3, 4) - 7(2, 5)	*AA*		10624.80(4)	10	1.0	0.722	21.73	
6(3, 4) - 7(2, 5)	*EE*		10620.94(9)	16	0.99			
6(3, 4) - 7(2, 5)	*EA*		10616.17(22)	4	0.97			
6(3, 4) - 7(2, 5)	*AE*		10618.02(16)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
7(0, 7) - 6(1, 6)	*AA*		111782.73(5)	10	1.0	4.014	13.82	
7(0, 7) - 6(1, 6)	*EE*	111783.01 (4)	111783.26(3)	6	1.0			
7(0, 7) - 6(1, 6)	*EA*		111783.79(7)	4	1.0			
7(0, 7) - 6(1, 6)	*AE*		111783.79(7)	6	1.0			
6(6, 1) - 7(5, 2)	*AA*		189461.46(21)	10	1.0	0.073	42.14	
6(6, 1) - 7(5, 2)	*EE*		189451.57(14)	16	0.00			
6(6, 1) - 7(5, 2)	*EA*		189441.66(28)	4	0.00			
6(6, 1) - 7(5, 2)	*AE*		189455.68(10)	6	1.0			
6(4, 3) - 7(3, 4)	*AA*	72033.95 (10)	72033.99(4)	10	1.0	0.435	26.52	
6(4, 3) - 7(3, 4)	*EE*	72025.15 (10)	72024.85(16)	16	0.56			
6(4, 3) - 7(3, 4)	*EA*		72015.12(33)	4	0.58			
6(4, 3) - 7(3, 4)	*AE*	72026.21 (10)	72026.10(14)	6	1.0			
7(1, 6) - 6(2, 5)	*AA*		60219.66(5)	10	1.0	1.340	17.17	
7(1, 6) - 6(2, 5)	*EE*		60221.66(8)	16	1.0			
7(1, 6) - 6(2, 5)	*EA*		60223.67(16)	4	1.0			
7(1, 6) - 6(2, 5)	*AE*		60223.64(16)	6	1.0			
7(3, 5) - 6(2, 4)	*AA*		277652.21(12)	6	1.0	3.045	17.25	
7(3, 5) - 6(2, 4)	*EE*		277648.50(7)	16	1.0			
7(3, 5) - 6(2, 4)	*EA*		277644.40(15)	2	1.0			
7(3, 5) - 6(2, 4)	*AE*		277645.16(13)	4	1.0			
7(1, 7) - 6(0, 6)	*AA*		147025.65(7)	6	1.0	4.567	13.19	
7(1, 7) - 6(0, 6)	*EE*		147024.94(2)	16	1.0			
7(1, 7) - 6(0, 6)	*EA*		147024.23(5)	2	1.0			
7(1, 7) - 6(0, 6)	*AE*		147024.23(5)	4	1.0			
7(2, 6) - 6(1, 5)	*AA*		208282.93(10)	6	1.0	2.710	14.64	
7(2, 6) - 6(1, 5)	*EE*		208280.66(5)	16	1.0			
7(2, 6) - 6(1, 5)	*EA*		208278.38(11)	2	1.0			
7(2, 6) - 6(1, 5)	*AE*		208278.38(11)	4	1.0			
6(6, 0) - 7(5, 3)	*AA*		189461.46(21)	6	1.0	0.073	42.14	
6(6, 0) - 7(5, 3)	*EE*		189465.57(6)	16	0.00			
6(6, 0) - 7(5, 3)	*EA*		189469.70(13)	2	0.00			
6(6, 0) - 7(5, 3)	*AE*		189455.68(10)	4	1.0			
6(4, 2) - 7(3, 5)	*AA*	72171.00 (10)	72171.05(4)	6	1.0	0.435	26.51	
6(4, 2) - 7(3, 5)	*EE*	72172.00 (10)	72172.30(2)	16	0.56			
6(4, 2) - 7(3, 5)	*EA*	72173.57 (10)	72174.14(5)	4	0.58			
6(4, 2) - 7(3, 5)	*AE*	72163.23 (10)	72163.16(14)	2	1.0			
7(1, 7) - 6(2, 4)	*AA*		25211.21(5)	6	1.0	0.723	17.25	
7(1, 7) - 6(2, 4)	*EE*		25213.74(3)	16	1.0			
7(1, 7) - 6(2, 4)	*EA*		25216.25(7)	2	1.0			
7(1, 7) - 6(2, 4)	*AE*		25216.28(7)	4	1.0			
6(5, 1) - 7(4, 4)	*AA*		130863.91(10)	6	1.0	0.218	33.35	
6(5, 1) - 7(4, 4)	*EE*		130868.93(9)	16	1.0			
6(5, 1) - 7(4, 4)	*EA*		130874.68(19)	2	1.0			
6(5, 1) - 7(4, 4)	*AE*		130856.39(10)	4	1.0			
6(3, 3) - 7(2, 6)	*AA*		14944.94(3)	6	1.0	0.707	21.59	
6(3, 3) - 7(2, 6)	*EE*		14942.01(5)	16	0.99			
6(3, 3) - 7(2, 6)	*EA*		14939.99(8)	2	0.97			
6(3, 3) - 7(2, 6)	*AE*		14938.14(14)	4	1.0			
7(5, 2) - 7(4, 3)	*AA*		263586.55(12)	10	1.0	2.481	33.35	
7(5, 2) - 7(4, 3)	*EE*		263582.79(8)	16	0.00			
7(5, 2) - 7(4, 3)	*EA*		263578.32(16)	4	0.00			
7(5, 2) - 7(4, 3)	*AE*		263579.19(11)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
7(3, 4) - 7(2, 5)	*AA*		143606.30(7)	10	1.0	3.578	21.73	
7(3, 4) - 7(2, 5)	*EE*		143603.06(7)	16	1.0			
7(3, 4) - 7(2, 5)	*EA*		143600.16(13)	4	1.0			
7(3, 4) - 7(2, 5)	*AE*		143599.44(16)	6	1.0			
7(1, 6) - 7(0, 7)	*AA*		48902.64(4)	10	1.0	5.559	17.55	
7(1, 6) - 7(0, 7)	*EE*		48901.52(4)	16	1.0			
7(1, 6) - 7(0, 7)	*EA*		48900.39(9)	4	1.0			
7(1, 6) - 7(0, 7)	*AE*		48900.39(9)	6	1.0			
7(4, 3) - 7(3, 4)	*AA*		204806.03(8)	10	1.0	3.059	26.52	
7(4, 3) - 7(3, 4)	*EE*		204806.31(1)	16	0.54			
7(4, 3) - 7(3, 4)	*EA*		204806.97(2)	4	0.47			
7(4, 3) - 7(3, 4)	*AE*		204798.19(15)	6	1.0			
7(2, 5) - 7(1, 6)	*AA*		76366.35(4)	10	1.0	5.051	19.18	
7(2, 5) - 7(1, 6)	*EE*		76364.26(6)	16	1.0			
7(2, 5) - 7(1, 6)	*EA*		76362.18(12)	4	1.0			
7(2, 5) - 7(1, 6)	*AE*		76362.16(12)	6	1.0			
7(4, 4) - 7(3, 5)	*AA*		204940.95(8)	6	1.0	3.059	26.51	
7(4, 4) - 7(3, 5)	*EE*		204932.82(15)	16	0.54			
7(4, 4) - 7(3, 5)	*EA*		204924.32(30)	2	0.47			
7(4, 4) - 7(3, 5)	*AE*		204933.11(15)	4	1.0			
7(2, 6) - 7(1, 7)	*AA*	104705.93 (10)	104705.95(5)	6	1.0	3.206	18.09	
7(2, 6) - 7(1, 7)	*EE*	104703.30 (10)	104703.33(4)	16	1.0			
7(2, 6) - 7(1, 7)	*EA*	104700.62 (10)	104700.69(8)	4	1.0			
7(2, 6) - 7(1, 7)	*AE*	104700.62 (10)	104700.70(8)	2	1.0			
7(5, 3) - 7(4, 4)	*AA*		263588.22(12)	6	1.0	2.481	33.35	
7(5, 3) - 7(4, 4)	*EE*		263584.61(3)	16	0.00			
7(5, 3) - 7(4, 4)	*EA*		263581.73(7)	2	0.00			
7(5, 3) - 7(4, 4)	*AE*		263580.86(11)	4	1.0			
7(3, 5) - 7(2, 6)	*AA*		147735.05(6)	6	1.0	3.512	21.59	
7(3, 5) - 7(2, 6)	*EE*		147731.43(7)	16	1.0			
7(3, 5) - 7(2, 6)	*EA*		147727.46(15)	2	1.0			
7(3, 5) - 7(2, 6)	*AE*		147728.18(13)	4	1.0			
8(2, 6) - 7(1, 7)	*AA*		262777.00(11)	6	1.0	1.581	18.09	
8(2, 6) - 7(1, 7)	*EE*		262774.25(7)	16	1.0			
8(2, 6) - 7(1, 7)	*EA*		262771.52(15)	2	1.0			
8(2, 6) - 7(1, 7)	*AE*		262771.50(15)	4	1.0			
8(3, 5) - 7(2, 6)	*AA*		299906.64(13)	6	1.0	3.139	21.59	
8(3, 5) - 7(2, 6)	*EE*		299903.24(5)	16	1.0			
8(3, 5) - 7(2, 6)	*EA*		299900.02(10)	2	1.0			
8(3, 5) - 7(2, 6)	*AE*		299899.69(12)	4	1.0			
7(7, 1) - 8(6, 2)	*AA*		228987.74(37)	6	1.0	0.064	57.95	
7(7, 1) - 8(6, 2)	*EE*		228983.24(11)	16	0.00			
7(7, 1) - 8(6, 2)	*EA*		228978.76(21)	2	0.00			
7(7, 1) - 8(6, 2)	*AE*		228984.83(11)	4	1.0			
7(5, 3) - 8(4, 4)	*AA*		111804.39(9)	6	1.0	0.381	38.41	
7(5, 3) - 8(4, 4)	*EE*		111793.23(20)	16	0.05			
7(5, 3) - 8(4, 4)	*EA*		111780.42(42)	2	0.01			
7(5, 3) - 8(4, 4)	*AE*		111796.98(11)	4	1.0			
8(2, 6) - 7(3, 5)	*AA*		10336.00(4)	6	1.0	0.945	26.51	
8(2, 6) - 7(3, 5)	*EE*		10339.49(10)	16	1.0			
8(2, 6) - 7(3, 5)	*EA*		10343.37(22)	2	1.0			
8(2, 6) - 7(3, 5)	*AE*		10342.63(19)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
8(0, 8) - 7(1, 7)	*AA*		132524.95(5)	6	1.0	4.921	18.09	
8(0, 8) - 7(1, 7)	*EE*		132525.39(3)	16	1.0			
8(0, 8) - 7(1, 7)	*EA*		132525.84(7)	2	1.0			
8(0, 8) - 7(1, 7)	*AE*		132525.84(7)	4	1.0			
7(6, 2) - 8(5, 3)	*AA*		170454.13(20)	6	1.0	0.191	47.20	
7(6, 2) - 8(5, 3)	*EE*		170444.40(12)	16	0.00			
7(6, 2) - 8(5, 3)	*EA*		170434.66(24)	2	0.00			
7(6, 2) - 8(5, 3)	*AE*		170448.41(9)	4	1.0			
7(4, 4) - 8(3, 5)	*AA*		52769.37(4)	6	1.0	0.632	31.59	
7(4, 4) - 8(3, 5)	*EE*		52761.03(17)	16	0.60			
7(4, 4) - 8(3, 5)	*EA*		52751.77(35)	2	0.57			
7(4, 4) - 8(3, 5)	*AE*		52761.60(16)	4	1.0			
8(1, 7) - 7(2, 6)	*AA*	83319.43 (10)	83319.56(5)	6	1.0	1.725	21.59	
8(1, 7) - 7(2, 6)	*EE*	83321.24 (10)	83321.43(9)	16	1.0			
8(1, 7) - 7(2, 6)	*EA*	83323.06 (10)	83323.30(18)	4	1.0			
8(1, 7) - 7(2, 6)	*AE*	83323.06 (10)	83323.29(18)	2	1.0			
8(3, 6) - 7(2, 5)	*AA*		295342.10(14)	10	1.0	3.208	21.73	
8(3, 6) - 7(2, 5)	*EE*		295338.55(7)	16	1.0			
8(3, 6) - 7(2, 5)	*EA*		295334.81(16)	4	1.0			
8(3, 6) - 7(2, 5)	*AE*		295335.15(15)	6	1.0			
8(1, 8) - 7(0, 7)	*AA*		162530.27(8)	10	1.0	5.364	17.55	
8(1, 8) - 7(0, 7)	*EE*		162529.62(3)	16	1.0			
8(1, 8) - 7(0, 7)	*EA*		162528.97(6)	4	1.0			
8(1, 8) - 7(0, 7)	*AE*		162528.97(6)	6	1.0			
8(2, 7) - 7(1, 6)	*AA*		223204.51(11)	10	1.0	3.045	19.18	
8(2, 7) - 7(1, 6)	*EE*		223202.32(6)	16	1.0			
8(2, 7) - 7(1, 6)	*EA*		223200.13(13)	4	1.0			
8(2, 7) - 7(1, 6)	*AE*		223200.13(13)	6	1.0			
7(6, 1) - 8(5, 4)	*AA*		170454.17(20)	10	1.0	0.191	47.20	
7(6, 1) - 8(5, 4)	*EE*		170458.19(7)	16	0.00			
7(6, 1) - 8(5, 4)	*EA*		170462.20(14)	4	0.00			
7(6, 1) - 8(5, 4)	*AE*		170448.45(9)	6	1.0			
7(4, 3) - 8(3, 6)	*AA*		53070.24(4)	10	1.0	0.632	31.58	
7(4, 3) - 8(3, 6)	*EE*		53070.83(2)	16	0.60			
7(4, 3) - 8(3, 6)	*EA*		53072.33(5)	4	0.57			
7(4, 3) - 8(3, 6)	*AE*		53062.49(16)	6	1.0			
8(1, 8) - 7(2, 5)	*AA*	37261.21 (5)	37261.28(6)	10	1.0	0.764	21.73	
8(1, 8) - 7(2, 5)	*EE*	37263.86 (3)	37263.85(4)	16	1.0			
8(1, 8) - 7(2, 5)	*EA*	37266.50 (5)	37266.40(9)	4	1.0			
8(1, 8) - 7(2, 5)	*AE*	37266.50 (5)	37266.42(9)	6	1.0			
7(7, 0) - 8(6, 3)	*AA*		228987.74(37)	10	1.0	0.064	57.95	
7(7, 0) - 8(6, 3)	*EE*		228989.33(3)	16	0.00			
7(7, 0) - 8(6, 3)	*EA*		228990.91(7)	4	0.00			
7(7, 0) - 8(6, 3)	*AE*		228984.83(11)	6	1.0			
7(5, 2) - 8(4, 5)	*AA*		111809.41(9)	10	1.0	0.381	38.41	
7(5, 2) - 8(4, 5)	*EE*		111813.16(9)	16	0.05			
7(5, 2) - 8(4, 5)	*EA*		111818.57(20)	4	0.01			
7(5, 2) - 8(4, 5)	*AE*		111802.00(11)	6	1.0			
8(2, 7) - 7(3, 4)	*AA*		3231.85(4)	10	1.0	0.912	26.52	
8(2, 7) - 7(3, 4)	*EE*		3235.00(6)	16	1.0			
8(2, 7) - 7(3, 4)	*EA*		3237.78(12)	4	1.0			
8(2, 7) - 7(3, 4)	*AE*		3238.52(15)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

J′(K′₋,K′₊) − J″(K″₋,K″₊)	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
8(5, 3) − 8(4, 4)	AA		263514.00(13)	6	1.0	3.171	38.41	
8(5, 3) − 8(4, 4)	EE		263511.48(7)	16	0.95			
8(5, 3) − 8(4, 4)	EA		263507.33(17)	2	0.99			
8(5, 3) − 8(4, 4)	AE		263506.78(12)	4	1.0			
8(3, 5) − 8(2, 6)	AA		141835.58(8)	6	1.0	4.237	26.86	
8(3, 5) − 8(2, 6)	EE		141832.31(8)	16	1.0			
8(3, 5) − 8(2, 6)	EA		141829.19(17)	2	1.0			
8(3, 5) − 8(2, 6)	AE		141828.88(18)	4	1.0			
8(1, 7) − 8(0, 8)	AA	55500.52 (8)	55500.56(5)	6	1.0	5.745	22.51	
8(1, 7) − 8(0, 8)	EE	55499.18 (5)	55499.36(5)	16	1.0			
8(1, 7) − 8(0, 8)	EA	55497.95 (5)	55498.15(11)	4	1.0			
8(1, 7) − 8(0, 8)	AE	55497.95 (5)	55498.15(11)	2	1.0			
8(4, 4) − 8(3, 5)	AA		204553.20(10)	6	1.0	3.701	31.59	
8(4, 4) − 8(3, 5)	EE		204552.40(1)	16	0.74			
8(4, 4) − 8(3, 5)	EA		204553.07(2)	2	0.65			
8(4, 4) − 8(3, 5)	AE		204545.48(17)	4	1.0			
8(2, 6) − 8(1, 7)	AA		74751.49(4)	6	1.0	6.102	24.36	
8(2, 6) − 8(1, 7)	EE		74749.50(6)	16	1.0			
8(2, 6) − 8(1, 7)	EA		74747.52(12)	2	1.0			
8(2, 6) − 8(1, 7)	AE		74747.51(12)	4	1.0			
8(4, 5) − 8(3, 6)	AA		204847.38(9)	10	1.0	3.699	31.58	
8(4, 5) − 8(3, 6)	EE		204840.47(16)	16	0.74			
8(4, 5) − 8(3, 6)	EA		204832.08(34)	4	0.65			
8(4, 5) − 8(3, 6)	AE		204839.68(16)	6	1.0			
8(2, 7) − 8(1, 8)	AA		109576.88(6)	10	1.0	3.531	22.97	
8(2, 7) − 8(1, 8)	EE		109574.22(4)	16	1.0			
8(2, 7) − 8(1, 8)	EA		109571.54(9)	4	1.0			
8(2, 7) − 8(1, 8)	AE		109571.55(9)	6	1.0			
8(5, 4) − 8(4, 5)	AA		263518.97(13)	10	1.0	3.171	38.41	
8(5, 4) − 8(4, 5)	EE		263514.28(4)	16	0.95			
8(5, 4) − 8(4, 5)	EA		263511.22(8)	4	0.99			
8(5, 4) − 8(4, 5)	AE		263511.75(12)	6	1.0			
8(3, 6) − 8(2, 7)	AA		148503.94(7)	10	1.0	4.105	26.63	
8(3, 6) − 8(2, 7)	EE		148500.48(7)	16	1.0			
8(3, 6) − 8(2, 7)	EA		148496.86(15)	4	1.0			
8(3, 6) − 8(2, 7)	AE		148497.17(14)	6	1.0			
9(2, 7) − 8(1, 8)	AA		290076.96(12)	10	1.0	1.449	22.97	
9(2, 7) − 8(1, 8)	EE		290074.13(9)	16	1.0			
9(2, 7) − 8(1, 8)	EA		290071.31(18)	4	1.0			
9(2, 7) − 8(1, 8)	AE		290071.30(18)	6	1.0			
8(7, 2) − 9(6, 3)	AA		209991.11(36)	10	1.0	0.170	63.64	
8(7, 2) − 9(6, 3)	EE		209986.67(9)	16	0.01			
8(7, 2) − 9(6, 3)	EA		209982.27(19)	4	0.00			
8(7, 2) − 9(6, 3)	AE		209988.20(10)	6	1.0			
8(5, 4) − 9(4, 5)	AA	92703.034(50)	92702.98(8)	10	1.0	0.564	44.11	
8(5, 4) − 9(4, 5)	EE		92693.42(20)	16	0.20			
8(5, 4) − 9(4, 5)	EA		92681.86(45)	4	0.08			
8(5, 4) − 9(4, 5)	AE		92695.67(13)	6	1.0			
9(2, 7) − 8(3, 6)	AA	31996.104(30)	31996.14(5)	10	1.0	1.175	31.58	
9(2, 7) − 8(3, 6)	EE	31999.328(30)	31999.44(11)	16	1.0			
9(2, 7) − 8(3, 6)	EA	32002.702(50)	32002.91(23)	4	1.0			
9(2, 7) − 8(3, 6)	AE	32002.464(30)	32002.58(22)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured requency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
9(0, 9) - 8(1, 8)	AA		153054.61(6)	10	1.0	5.886	22.97	
9(0, 9) - 8(1, 8)	EE		153054.97(3)	16	1.0			
9(0, 9) - 8(1, 8)	EA		153055.33(7)	4	1.0			
9(0, 9) - 8(1, 8)	AE		153055.33(7)	6	1.0			
8(8, 1) - 9(7, 2)	AA		268458.59(61)	10	1.0	0.057	76.34	
8(8, 1) - 9(7, 2)	EE		268456.50(7)	16	1.0			
8(8, 1) - 9(7, 2)	EA		268454.40(14)	4	1.0			
8(8, 1) - 9(7, 2)	AE		268459.03(10)	6	1.0			
8(6, 3) - 9(5, 4)	AA		151424.59(19)	10	1.0	0.339	52.90	
8(6, 3) - 9(5, 4)	EE		151415.07(14)	16	0.00			
8(6, 3) - 9(5, 4)	EA		151405.51(27)	4	0.00			
8(6, 3) - 9(5, 4)	AE		151418.96(8)	6	1.0			
8(4, 5) - 9(3, 6)	AA		33344.30(4)	10	1.0	0.840	37.30	
8(4, 5) - 9(3, 6)	EE		33337.32(17)	16	0.71			
8(4, 5) - 9(3, 6)	EA		33328.63(37)	4	0.60			
8(4, 5) - 9(3, 6)	AE		33336.71(17)	6	1.0			
9(1, 8) - 8(2, 7)	AA		106775.80(6)	10	1.0	2.160	26.63	
9(1, 8) - 8(2, 7)	EE		106777.52(9)	16	1.0			
9(1, 8) - 8(2, 7)	EA		106779.25(19)	4	1.0			
9(1, 8) - 8(2, 7)	AE		106779.24(19)	6	1.0			
9(1, 9) - 8(0, 8)	AA		178045.69(8)	6	1.0	6.228	22.51	
9(1, 9) - 8(0, 8)	EE		178045.11(2)	16	1.0			
9(1, 9) - 8(0, 8)	EA		178044.53(5)	2	1.0			
9(1, 9) - 8(0, 8)	AE		178044.53(5)	4	1.0			
9(2, 8) - 8(1, 7)	AA		237623.05(13)	6	1.0	3.418	24.36	
9(2, 8) - 8(1, 7)	EE		237620.96(7)	16	1.0			
9(2, 8) - 8(1, 7)	EA		237618.87(14)	2	1.0			
9(2, 8) - 8(1, 7)	AE		237618.88(14)	4	1.0			
8(8, 0) - 9(7, 3)	AA		268458.59(61)	6	1.0	0.057	76.34	
8(8, 0) - 9(7, 3)	EE		268461.12(8)	16	1.0			
8(8, 0) - 9(7, 3)	EA		268463.65(17)	2	1.0			
8(8, 0) - 9(7, 3)	AE		268459.03(10)	4	1.0			
8(6, 2) - 9(5, 5)	AA		151424.73(19)	6	1.0	0.339	52.90	
8(6, 2) - 9(5, 5)	EE		151428.61(9)	16	0.00			
8(6, 2) - 9(5, 5)	EA		151432.54(17)	2	0.00			
8(6, 2) - 9(5, 5)	AE		151419.11(8)	4	1.0			
8(4, 4) - 9(3, 7)	AA		33944.00(4)	6	1.0	0.839	37.28	
8(4, 4) - 9(3, 7)	EE		33943.38(1)	16	0.71			
8(4, 4) - 9(3, 7)	EA		33944.47(4)	2	0.60			
8(4, 4) - 9(3, 7)	AE		33936.41(17)	4	1.0			
9(1, 9) - 8(2, 6)	AA		47793.64(7)	6	1.0	0.763	26.86	
9(1, 9) - 8(2, 6)	EE		47796.26(6)	16	1.0			
9(1, 9) - 8(2, 6)	EA		47798.86(12)	2	1.0			
9(1, 9) - 8(2, 6)	AE		47798.87(12)	4	1.0			
8(7, 1) - 9(6, 4)	AA		209991.11(36)	6	1.0	0.170	63.64	
8(7, 1) - 9(6, 4)	EE		209992.64(4)	16	0.01			
8(7, 1) - 9(6, 4)	EA		209994.14(8)	2	0.08			
8(7, 1) - 9(6, 4)	AE		209988.20(10)	4	1.0			
8(5, 3) - 9(4, 6)	AA	92716.086(50)	92716.01(8)	6	1.0	0.564	44.11	
8(5, 3) - 9(4, 6)	EE	92717.958(50)	92718.26(7)	16	0.20			
8(5, 3) - 9(4, 6)	EA		92722.51(18)	4	0.08			
8(5, 3) - 9(4, 6)	AE		92708.70(13)	2	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
9(2, 8) - 8(3, 5)	*AA*		21035.97(4)	6	1.0	1.107	31.59	
9(2, 8) - 8(3, 5)	*EE*		21039.15(7)	16	1.0			
9(2, 8) - 8(3, 5)	*EA*		21042.15(14)	2	1.0			
9(2, 8) - 8(3, 5)	*AE*		21042.49(15)	4	1.0			
9(5, 4) - 9(4, 5)	*AA*		263407.79(16)	10	1.0	3.833	44.11	
9(5, 4) - 9(4, 5)	*EE*		263406.63(6)	16	0.81			
9(5, 4) - 9(4, 5)	*EA*		263403.55(17)	4	0.92			
9(5, 4) - 9(4, 5)	*AE*		263400.66(15)	6	1.0			
9(3, 6) - 9(2, 7)	*AA*		139506.95(10)	10	1.0	4.929	32.65	
9(3, 6) - 9(2, 7)	*EE*		139503.72(10)	16	1.0			
9(3, 6) - 9(2, 7)	*EA*		139500.55(20)	4	1.0			
9(3, 6) - 9(2, 7)	*AE*		139500.40(21)	6	1.0			
9(1, 8) - 9(0, 9)	*AA*		63298.07(6)	10	1.0	5.802	28.08	
9(1, 8) - 9(0, 9)	*EE*		63296.77(7)	16	1.0			
9(1, 8) - 9(0, 9)	*EA*		63295.46(15)	4	1.0			
9(1, 8) - 9(0, 9)	*AE*		63295.46(15)	6	1.0			
9(4, 5) - 9(3, 6)	*AA*		204160.29(12)	10	1.0	4.333	37.30	
9(4, 5) - 9(3, 6)	*EE*		204158.18(1)	16	0.90			
9(4, 5) - 9(3, 6)	*EA*		204157.99(3)	4	0.79			
9(4, 5) - 9(3, 6)	*AE*		204152.79(16)	6	1.0			
9(2, 7) - 9(1, 8)	*AA*		73724.28(4)	10	1.0	7.183	30.19	
9(2, 7) - 9(1, 8)	*EE*		73722.40(5)	16	1.0			
9(2, 7) - 9(1, 8)	*EA*		73720.52(11)	4	1.0			
9(2, 7) - 9(1, 8)	*AE*		73720.51(11)	6	1.0			
9(4, 6) - 9(3, 7)	*AA*		204741.99(12)	6	1.0	4.328	37.28	
9(4, 6) - 9(3, 7)	*EE*		204736.60(14)	16	0.90			
9(4, 6) - 9(3, 7)	*EA*		204729.29(33)	2	0.79			
9(4, 6) - 9(3, 7)	*AE*		204734.49(16)	4	1.0			
9(2, 8) - 9(1, 9)	*AA*		115077.91(7)	6	1.0	3.814	28.45	
9(2, 8) - 9(1, 9)	*EE*		115075.20(5)	16	1.0			
9(2, 8) - 9(1, 9)	*EA*		115072.48(10)	2	1.0			
9(2, 8) - 9(1, 9)	*AE*		115072.49(10)	4	1.0			
9(5, 5) - 9(4, 6)	*AA*		263420.65(16)	6	1.0	3.833	44.11	
9(5, 5) - 9(4, 6)	*EE*		263414.68(9)	16	0.81			
9(5, 5) - 9(4, 6)	*EA*		263410.63(13)	2	0.92			
9(5, 5) - 9(4, 6)	*AE*		263413.52(15)	4	1.0			
9(3, 7) - 9(2, 8)	*AA*		149573.23(8)	6	1.0	4.686	32.29	
9(3, 7) - 9(2, 8)	*EE*		149569.88(7)	16	1.0			
9(3, 7) - 9(2, 8)	*EA*		149566.46(15)	2	1.0			
9(3, 7) - 9(2, 8)	*AE*		149566.59(15)	4	1.0			
9(7, 3) - 10(6, 4)	*AA*		190978.44(36)	6	1.0	0.306	69.97	
9(7, 3) - 10(6, 4)	*EE*		190974.10(8)	16	1.0			
9(7, 3) - 10(6, 4)	*EA*		190969.75(16)	2	1.0			
9(7, 3) - 10(6, 4)	*AE*		190975.56(9)	4	1.0			
9(5, 5) - 10(4, 6)	*AA*	73546.28 (5)	73546.31(8)	6	1.0	0.760	50.44	
9(5, 5) - 10(4, 6)	*EE*	73538.62 (20)	73537.89(19)	16	0.36			
9(5, 5) - 10(4, 6)	*EA*		73528.09(42)	4	0.24			
9(5, 5) - 10(4, 6)	*AE*		73539.15(14)	2	1.0			
10(2, 8) - 9(3, 7)	*AA*	54413.72 (6)	54413.71(6)	6	1.0	1.413	37.28	
10(2, 8) - 9(3, 7)	*EE*	54416.80 (5)	54416.85(13)	16	1.0			
10(2, 8) - 9(3, 7)	*EA*	54419.95 (6)	54420.07(26)	4	1.0			
10(2, 8) - 9(3, 7)	*AE*	54419.95 (6)	54419.93(26)	2	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
10(0,10) - 9(1, 9)	AA		173292.83(7)	6	1.0	6.893	28.45	
10(0,10) - 9(1, 9)	EE		173293.10(3)	16	1.0			
10(0,10) - 9(1, 9)	EA		173293.38(7)	2	1.0			
10(0,10) - 9(1, 9)	AE		173293.38(7)	4	1.0			
9(8, 2) - 10(7, 3)	AA		249470.22(60)	6	1.0	0.153	82.66	
9(8, 2) - 10(7, 3)	EE		249468.16(6)	16	1.0			
9(8, 2) - 10(7, 3)	EA		249466.13(12)	2	1.0			
9(8, 2) - 10(7, 3)	AE		249470.66(11)	4	1.0			
9(6, 4) - 10(5, 5)	AA		132367.85(19)	6	1.0	0.509	59.22	
9(6, 4) - 10(5, 5)	EE		132358.68(15)	16	0.00			
9(6, 4) - 10(5, 5)	EA		132349.30(32)	2	0.00			
9(6, 4) - 10(5, 5)	AE		132362.29(7)	4	1.0			
9(4, 6) - 10(3, 7)	AA		13699.04(4)	6	1.0	1.053	43.65	
9(4, 6) - 10(3, 7)	EE		13693.63(16)	16	0.90			
9(4, 6) - 10(3, 7)	EA		13686.20(37)	2	0.77			
9(4, 6) - 10(3, 7)	AE		13691.63(19)	4	1.0			
10(1, 9) - 9(2, 8)	AA		130516.45(6)	6	1.0	2.651	32.29	
10(1, 9) - 9(2, 8)	EE		130518.02(10)	16	1.0			
10(1, 9) - 9(2, 8)	EA		130519.60(21)	2	1.0			
10(1, 9) - 9(2, 8)	AE		130519.59(21)	4	1.0			
10(1,10) - 9(0, 9)	AA		193680.69(9)	10	1.0	7.147	28.08	
10(1,10) - 9(0, 9)	EE		193680.18(2)	16	1.0			
10(1,10) - 9(0, 9)	EA		193679.67(5)	4	1.0			
10(1,10) - 9(0, 9)	AE		193679.67(5)	6	1.0			
10(2, 9) - 9(1, 8)	AA		251585.67(16)	10	1.0	3.836	30.19	
10(2, 9) - 9(1, 8)	EE		251583.70(7)	16	1.0			
10(2, 9) - 9(1, 8)	EA		251581.73(15)	4	1.0			
10(2, 9) - 9(1, 8)	AE		251581.73(15)	6	1.0			
9(8, 1) - 10(7, 4)	AA		249470.22(60)	10	1.0	0.153	82.66	
9(8, 1) - 10(7, 4)	EE		249472.72(10)	16	1.0			
9(8, 1) - 10(7, 4)	EA		249475.19(19)	4	1.0			
9(8, 1) - 10(7, 4)	AE		249470.66(11)	6	1.0			
9(6, 3) - 10(5, 6)	AA		132368.28(19)	10	1.0	0.509	59.22	
9(6, 3) - 10(5, 6)	EE		132371.89(8)	16	0.00			
9(6, 3) - 10(5, 6)	EA		132375.70(17)	4	0.00			
9(6, 3) - 10(5, 6)	AE		132362.72(7)	6	1.0			
9(4, 5) - 10(3, 8)	AA		14807.08(4)	10	1.0	1.050	43.62	
9(4, 5) - 10(3, 8)	EE		14805.08(2)	16	0.90			
9(4, 5) - 10(3, 8)	EA		14805.11(4)	4	0.77			
9(4, 5) - 10(3, 8)	AE		14799.67(19)	6	1.0			
10(1,10) - 9(2, 7)	AA	56658.35 (5)	56658.34(9)	10	1.0	0.725	32.65	
10(1,10) - 9(2, 7)	EE	56661.20 (5)	56661.02(7)	16	1.0			
10(1,10) - 9(2, 7)	EA	56663.90 (5)	56663.69(15)	4	1.0			
10(1,10) - 9(2, 7)	AE	56663.90 (5)	56663.70(15)	6	1.0			
9(7, 2) - 10(6, 5)	AA		190978.44(36)	10	1.0	0.306	69.97	
9(7, 2) - 10(6, 5)	EE		190979.88(5)	16	1.0			
9(7, 2) - 10(6, 5)	EA		190981.35(9)	4	1.0			
9(7, 2) - 10(6, 5)	AE		190975.56(9)	6	1.0			
9(5, 4) - 10(4, 7)	AA		73576.67(8)	10	1.0	0.760	50.44	
9(5, 4) - 10(4, 7)	EE		73577.94(4)	16	0.36			
9(5, 4) - 10(4, 7)	EA		73580.58(13)	4	0.24			
9(5, 4) - 10(4, 7)	AE		73569.51(14)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
10(2, 9) - 9(3, 6)	*AA*	38354.45 (4)	38354.45(4)	10	1.0	1.287	37.30	
10(2, 9) - 9(3, 6)	*EE*	38357.58 (4)	38357.59(8)	16	1.0			
10(2, 9) - 9(3, 6)	*EA*	38360.70 (5)	38360.67(16)	4	1.0			
10(2, 9) - 9(3, 6)	*AE*	38360.70 (5)	38360.83(17)	6	1.0			
10(5, 5) - 10(4, 6)	*AA*		263257.56(19)	6	1.0	4.478	50.44	
10(5, 5) - 10(4, 6)	*EE*		263257.18(2)	16	0.68			
10(5, 5) - 10(4, 6)	*EA*		263255.71(10)	2	0.78			
10(5, 5) - 10(4, 6)	*AE*		263250.65(15)	4	1.0			
10(3, 7) - 10(2, 8)	*AA*		136629.24(12)	6	1.0	5.670	39.10	
10(3, 7) - 10(2, 8)	*EE*		136626.12(11)	16	1.0			
10(3, 7) - 10(2, 8)	*EA*		136623.02(23)	2	1.0			
10(3, 7) - 10(2, 8)	*AE*		136622.93(23)	4	1.0			
10(1, 9) - 10(0,10)	*AA*		72301.53(7)	6	1.0	5.763	34.23	
10(1, 9) - 10(0,10)	*EE*		72300.12(9)	16	1.0			
10(1, 9) - 10(0,10)	*EA*		72298.70(18)	2	1.0			
10(1, 9) - 10(0,10)	*AE*		72298.70(18)	4	1.0			
10(4, 6) - 10(3, 7)	*AA*		203573.38(15)	6	1.0	4.962	43.65	
10(4, 6) - 10(3, 7)	*EE*		203570.43(6)	16	0.98			
10(4, 6) - 10(3, 7)	*EA*		203568.74(8)	2	0.93			
10(4, 6) - 10(3, 7)	*AE*		203566.01(19)	4	1.0			
10(2, 8) - 10(1, 9)	*AA*		73470.49(5)	6	1.0	8.247	36.64	
10(2, 8) - 10(1, 9)	*EE*		73468.71(5)	16	1.0			
10(2, 8) - 10(1, 9)	*EA*		73466.93(10)	2	1.0			
10(2, 8) - 10(1, 9)	*AE*		73466.93(10)	4	1.0			
10(4, 7) - 10(3, 8)	*AA*		204638.20(14)	10	1.0	4.952	43.62	
10(4, 7) - 10(3, 8)	*EE*		204633.78(13)	16	0.98			
10(4, 7) - 10(3, 8)	*EA*		204628.09(31)	4	0.93			
10(4, 7) - 10(3, 8)	*AE*		204630.82(19)	6	1.0			
10(2, 9) - 10(1,10)	*AA*		121203.05(9)	10	1.0	4.055	34.54	
10(2, 9) - 10(1,10)	*EE*		121200.28(6)	16	1.0			
10(2, 9) - 10(1,10)	*EA*		121197.52(12)	4	1.0			
10(2, 9) - 10(1,10)	*AE*		121197.52(12)	6	1.0			
10(5, 6) - 10(4, 7)	*AA*		263287.36(19)	10	1.0	4.478	50.44	
10(5, 6) - 10(4, 7)	*EE*		263280.81(13)	16	0.68			
10(5, 6) - 10(4, 7)	*EA*		263275.38(21)	4	0.78			
10(5, 6) - 10(4, 7)	*AE*		263280.45(15)	6	1.0			
10(3, 8) - 10(2, 9)	*AA*		150998.77(10)	10	1.0	5.253	38.58	
10(3, 8) - 10(2, 9)	*EE*		150995.52(7)	16	1.0			
10(3, 8) - 10(2, 9)	*EA*		150992.22(15)	4	1.0			
10(3, 8) - 10(2, 9)	*AE*		150992.30(14)	6	1.0			
10(9, 2) - 11(8, 3)	*AA*		288885.07(91)	10	1.0	0.139	104.26	
10(9, 2) - 11(8, 3)	*EE*		288881.32(5)	16	1.0			
10(9, 2) - 11(8, 3)	*EA*		288877.57(10)	4	1.0			
10(9, 2) - 11(8, 3)	*AE*		288888.70(16)	6	1.0			
10(7, 4) - 11(6, 5)	*AA*		171946.52(35)	10	1.0	0.463	76.93	
10(7, 4) - 11(6, 5)	*EE*		171942.27(7)	16	1.0			
10(7, 4) - 11(6, 5)	*EA*		171937.99(15)	4	1.0			
10(7, 4) - 11(6, 5)	*AE*		171943.64(10)	6	1.0			
10(5, 6) - 11(4, 7)	*AA*		54319.96(8)	10	1.0	0.964	57.41	
10(5, 6) - 11(4, 7)	*EE*		54312.29(18)	16	0.46			
10(5, 6) - 11(4, 7)	*EA*		54303.76(39)	4	0.37			
10(5, 6) - 11(4, 7)	*AE*		54312.99(15)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
11(2, 9) - 10(3, 8)	*AA*		77607.68(7)	10	1.0	1.663	43.62	
11(2, 9) - 10(3, 8)	*EE*		77610.65(13)	16	1.0			
11(2, 9) - 10(3, 8)	*EA*		77613.66(28)	4	1.0			
11(2, 9) - 10(3, 8)	*AE*		77613.59(27)	6	1.0			
11(0,11) - 10(1,10)	*AA*		193196.49(8)	10	1.0	7.927	34.54	
11(0,11) - 10(1,10)	*EE*		193196.69(3)	16	1.0			
11(0,11) - 10(1,10)	*EA*		193196.90(6)	4	1.0			
11(0,11) - 10(1,10)	*AE*		193196.90(6)	6	1.0			
10(8, 3) - 11(7, 4)	*AA*		230469.81(59)	10	1.0	0.278	89.62	
10(8, 3) - 11(7, 4)	*EE*		230467.78(5)	16	0.01			
10(8, 3) - 11(7, 4)	*EA*		230465.75(12)	4	0.00			
10(8, 3) - 11(7, 4)	*AE*		230470.19(11)	6	1.0			
10(6, 5) - 11(5, 6)	*AA*		113278.39(18)	10	1.0	0.692	66.19	
10(6, 5) - 11(5, 6)	*EE*		113269.78(18)	16	1.0			
10(6, 5) - 11(5, 6)	*EA*		113260.67(35)	4	1.0			
10(6, 5) - 11(5, 6)	*AE*		113272.95(7)	6	1.0			
11(3, 8) - 10(4, 7)	*AA*		6240.86(5)	10	1.0	1.269	50.44	
11(3, 8) - 10(4, 7)	*EE*		6245.25(14)	16	0.98			
11(3, 8) - 10(4, 7)	*EA*		6250.97(34)	4	0.92			
11(3, 8) - 10(4, 7)	*AE*		6248.11(22)	6	1.0			
11(1,10) - 10(2, 9)	*AA*		154453.81(7)	10	1.0	3.207	38.58	
11(1,10) - 10(2, 9)	*EE*		154455.22(11)	16	1.0			
11(1,10) - 10(2, 9)	*EA*		154456.62(22)	4	1.0			
11(1,10) - 10(2, 9)	*AE*		154456.62(22)	6	1.0			
11(1,11) - 10(0,10)	*AA*		209516.11(11)	6	1.0	8.110	34.23	
11(1,11) - 10(0,10)	*EE*		209515.68(2)	16	1.0			
11(1,11) - 10(0,10)	*EA*		209515.25(4)	2	1.0			
11(1,11) - 10(0,10)	*AE*		209515.25(4)	4	1.0			
11(2,10) - 10(1, 9)	*AA*		265154.59(19)	6	1.0	4.307	36.64	
11(2,10) - 10(1, 9)	*EE*		265152.75(8)	16	1.0			
11(2,10) - 10(1, 9)	*EA*		265150.90(16)	2	1.0			
11(2,10) - 10(1, 9)	*AE*		265150.90(16)	4	1.0			
10(8, 2) - 11(7, 5)	*AA*		230469.81(59)	6	1.0	0.278	89.62	
10(8, 2) - 11(7, 5)	*EE*		230472.22(10)	16	0.01			
10(8, 2) - 11(7, 5)	*EA*		230474.62(21)	2	0.00			
10(8, 2) - 11(7, 5)	*AE*		230470.19(11)	4	1.0			
10(6, 4) - 11(5, 7)	*AA*		113279.53(18)	6	1.0	0.692	66.19	
10(6, 4) - 11(5, 7)	*EE*		113282.72(10)	16	1.0			
10(6, 4) - 11(5, 7)	*EA*		113286.39(20)	2	1.0			
10(6, 4) - 11(5, 7)	*AE*		113274.09(7)	4	1.0			
11(3, 9) - 10(4, 6)	*AA*		4316.14(4)	6	1.0	1.264	50.44	
11(3, 9) - 10(4, 6)	*EE*		4318.97(6)	16	0.98			
11(3, 9) - 10(4, 6)	*EA*		4320.50(8)	2	0.92			
11(3, 9) - 10(4, 6)	*AE*		4323.36(21)	4	1.0			
11(1,11) - 10(2, 8)	*AA*		63744.09(10)	6	1.0	0.663	39.10	
11(1,11) - 10(2, 8)	*EE*		63746.86(9)	16	1.0			
11(1,11) - 10(2, 8)	*EA*		63749.62(19)	2	1.0			
11(1,11) - 10(2, 8)	*AE*		63749.62(19)	4	1.0			
10(9, 1) - 11(8, 4)	*AA*		288885.07(91)	6	1.0	0.139	104.26	
10(9, 1) - 11(8, 4)	*EE*		288892.45(20)	16	1.0			
10(9, 1) - 11(8, 4)	*EA*		288899.82(42)	2	1.0			
10(9, 1) - 11(8, 4)	*AE*		288888.70(16)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
10(7, 3) - 11(6, 6)	*AA*		171946.53(35)	6	1.0	0.463	76.93	
10(7, 3) - 11(6, 6)	*EE*		171947.90(4)	16	1.0			
10(7, 3) - 11(6, 6)	*EA*		171949.31(10)	2	1.0			
10(7, 3) - 11(6, 6)	*AE*		171943.65(10)	4	1.0			
10(5, 5) - 11(4, 8)	*AA*		54384.89(8)	6	1.0	0.964	57.41	
10(5, 5) - 11(4, 8)	*EE*		54385.58(2)	16	0.46			
10(5, 5) - 11(4, 8)	*EA*		54387.14(8)	2	0.37			
10(5, 5) - 11(4, 8)	*AE*		54377.92(15)	4	1.0			
11(2,10) - 10(3, 7)	*AA*	55054.84 (5)	55054.85(5)	6	1.0	1.443	43.65	
11(2,10) - 10(3, 7)	*EE*	55057.93 (4)	55057.91(8)	16	1.0			
11(2,10) - 10(3, 7)	*EA*	55060.97 (5)	55060.94(16)	4	1.0			
11(2,10) - 10(3, 7)	*AE*	55060.97 (5)	55061.04(17)	2	1.0			
11(5, 6) - 11(4, 7)	*AA*		263050.33(23)	10	1.0	5.113	57.41	
11(5, 6) - 11(4, 7)	*EE*		263050.03(1)	16	0.64			
11(5, 6) - 11(4, 7)	*EA*		263049.58(4)	4	0.67			
11(5, 6) - 11(4, 7)	*AE*		263043.58(17)	6	1.0			
11(3, 8) - 11(2, 9)	*AA*		133271.38(15)	10	1.0	6.479	46.21	
11(3, 8) - 11(2, 9)	*EE*		133268.38(12)	16	1.0			
11(3, 8) - 11(2, 9)	*EA*		133265.40(25)	4	1.0			
11(3, 8) - 11(2, 9)	*AE*		133265.35(25)	6	1.0			
11(1,10) - 11(0,11)	*AA*	82460.36 (10)	82460.38(8)	10	1.0	5.663	40.98	
11(1,10) - 11(0,11)	*EE*	82458.62 (10)	82458.82(11)	16	1.0			
11(1,10) - 11(0,11)	*EA*	82456.96 (10)	82457.25(22)	4	1.0			
11(1,10) - 11(0,11)	*AE*	82456.96 (10)	82457.25(22)	6	1.0			
11(4, 7) - 11(3, 8)	*AA*		202726.53(19)	10	1.0	5.594	50.65	
11(4, 7) - 11(3, 8)	*EE*		202723.26(9)	16	1.0			
11(4, 7) - 11(3, 8)	*EA*		202720.64(16)	4	1.0			
11(4, 7) - 11(3, 8)	*AE*		202719.34(22)	6	1.0			
11(2, 9) - 11(1,10)	*AA*		74152.64(5)	10	1.0	9.236	43.73	
11(2, 9) - 11(1,10)	*EE*		74150.95(4)	16	1.0			
11(2, 9) - 11(1,10)	*EA*		74149.26(9)	4	1.0			
11(2, 9) - 11(1,10)	*AE*		74149.26(9)	6	1.0			
11(4, 8) - 11(3, 9)	*AA*		204556.52(17)	6	1.0	5.574	50.59	
11(4, 8) - 11(3, 9)	*EE*		204552.63(12)	16	1.0			
11(4, 8) - 11(3, 9)	*EA*		204548.07(28)	2	1.0			
11(4, 8) - 11(3, 9)	*AE*		204549.36(21)	4	1.0			
11(2,10) - 11(1,11)	*AA*		127940.00(12)	6	1.0	4.257	41.22	
11(2,10) - 11(1,11)	*EE*		127937.17(6)	16	1.0			
11(2,10) - 11(1,11)	*EA*		127934.34(13)	2	1.0			
11(2,10) - 11(1,11)	*AE*		127934.34(13)	4	1.0			
11(5, 7) - 11(4, 8)	*AA*		263113.70(23)	6	1.0	5.112	57.41	
11(5, 7) - 11(4, 8)	*EE*		263107.25(16)	16	0.64			
11(5, 7) - 11(4, 8)	*EA*		263100.95(30)	2	0.67			
11(5, 7) - 11(4, 8)	*AE*		263106.95(17)	4	1.0			
11(3, 9) - 11(2,10)	*AA*		152834.67(12)	6	1.0	5.802	45.49	
11(3, 9) - 11(2,10)	*EE*		152831.48(8)	16	1.0			
11(3, 9) - 11(2,10)	*EA*		152828.29(15)	2	1.0			
11(3, 9) - 11(2,10)	*AE*		152828.33(15)	4	1.0			
11(9, 3) - 12(8, 4)	*AA*		269894.55(91)	6	1.0	0.255	111.85	
11(9, 3) - 12(8, 4)	*EE*		269890.86(4)	16	0.00			
11(9, 3) - 12(8, 4)	*EA*		269887.18(9)	2	0.00			
11(9, 3) - 12(8, 4)	*AE*		269898.05(18)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

J'(K'₋,K'₊) – J"(K"₋,K"₊)	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
11(7, 5) – 12(6, 6)	AA		152891.85(35)	6	1.0	0.636	84.52	
11(7, 5) – 12(6, 6)	EE		152887.69(5)	16	0.01			
11(7, 5) – 12(6, 6)	EA		152883.57(11)	2	0.00			
11(7, 5) – 12(6, 6)	AE		152889.04(8)	4	1.0			
11(5, 7) – 12(4, 8)	AA		35005.92(8)	6	1.0	1.174	65.02	
11(5, 7) – 12(4, 8)	EE		34998.92(19)	16	0.61			
11(5, 7) – 12(4, 8)	EA		34991.11(41)	2	0.61			
11(5, 7) – 12(4, 8)	AE		34999.08(18)	4	1.0			
12(2,10) – 11(3, 9)	AA	101559.35 (10)	101559.30(7)	6	1.0	1.930	50.59	
12(2,10) – 11(3, 9)	EE	101562.17 (10)	101562.13(16)	16	1.0			
12(2,10) – 11(3, 9)	EA	101564.90 (10)	101564.96(31)	4	1.0			
12(2,10) – 11(3, 9)	AE	101564.90 (10)	101564.92(31)	2	1.0			
12(0,12) – 11(1,11)	AA		212755.99(10)	6	1.0	8.974	41.22	
12(0,12) – 11(1,11)	EE		212756.12(2)	16	1.0			
12(0,12) – 11(1,11)	EA		212756.24(5)	2	1.0			
12(0,12) – 11(1,11)	AE		212756.24(5)	4	1.0			
11(8, 4) – 12(7, 5)	AA		211455.14(58)	6	1.0	0.424	97.21	
11(8, 4) – 12(7, 5)	EE		211453.08(4)	16	0.00			
11(8, 4) – 12(7, 5)	EA		211451.05(9)	2	0.00			
11(8, 4) – 12(7, 5)	AE		211455.39(11)	4	1.0			
11(6, 6) – 12(5, 7)	AA		94150.03(18)	6	1.0	0.887	73.78	
11(6, 6) – 12(5, 7)	EE		94142.28(18)	16	0.97			
11(6, 6) – 12(5, 7)	EA		94133.47(39)	2	0.99			
11(6, 6) – 12(5, 7)	AE		94144.72(7)	4	1.0			
12(3, 9) – 11(4, 8)	AA	26564.80 (30)	26564.68(5)	6	1.0	1.486	57.41	
12(3, 9) – 11(4, 8)	EE	26568.544(50)	26568.52(14)	16	1.0			
12(3, 9) – 11(4, 8)	EA	26572.82 (8)	26573.07(31)	4	1.0			
12(3, 9) – 11(4, 8)	AE	26571.66 (8)	26571.71(25)	2	1.0			
12(1,11) – 11(2,10)	AA		178484.34(8)	6	1.0	3.836	45.49	
12(1,11) – 11(2,10)	EE		178485.59(11)	16	1.0			
12(1,11) – 11(2,10)	EA		178486.84(23)	2	1.0			
12(1,11) – 11(2,10)	AE		178486.84(23)	4	1.0			
12(1,12) – 11(0,11)	AA		225599.52(13)	10	1.0	9.103	40.98	
12(1,12) – 11(0,11)	EE		225599.14(2)	16	1.0			
12(1,12) – 11(0,11)	EA		225598.77(4)	4	1.0			
12(1,12) – 11(0,11)	AE		225598.77(4)	6	1.0			
12(2,11) – 11(1,10)	AA		278408.81(23)	10	1.0	4.838	43.73	
12(2,11) – 11(1,10)	EE		278407.11(9)	16	1.0			
12(2,11) – 11(1,10)	EA		278405.40(18)	4	1.0			
12(2,11) – 11(1,10)	AE		278405.40(18)	6	1.0			
11(8, 3) – 12(7, 6)	AA		211455.14(58)	10	1.0	0.424	97.21	
11(8, 3) – 12(7, 6)	EE		211457.42(10)	16	0.00			
11(8, 3) – 12(7, 6)	EA		211459.70(21)	4	0.00			
11(8, 3) – 12(7, 6)	AE		211455.39(11)	6	1.0			
11(6, 5) – 12(5, 8)	AA		94152.79(18)	10	1.0	0.887	73.78	
11(6, 5) – 12(5, 8)	EE		94155.23(10)	16	0.97			
11(6, 5) – 12(5, 8)	EA		94158.73(24)	4	0.99			
11(6, 5) – 12(5, 8)	AE		94147.48(7)	6	1.0			
12(3,10) – 11(4, 7)	AA		23389.92(4)	10	1.0	1.746	57.41	
12(3,10) – 11(4, 7)	EE		23393.08(9)	16	1.0			
12(3,10) – 11(4, 7)	EA		23395.56(16)	4	1.0			
12(3,10) – 11(4, 7)	AE		23396.92(23)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
12(1,12) - 11(2, 9)	*AA*		68986.51(10)	10	1.0	0.588	46.21	
12(1,12) - 11(2, 9)	*EE*		68989.38(12)	16	1.0			
12(1,12) - 11(2, 9)	*EA*		68992.26(24)	4	1.0			
12(1,12) - 11(2, 9)	*AE*		68992.26(24)	6	1.0			
11(9, 2) - 12(8, 5)	*AA*		269894.55(91)	10	1.0	0.255	111.85	
11(9, 2) - 12(8, 5)	*EE*		269901.74(22)	16	0.00			
11(9, 2) - 12(8, 5)	*EA*		269908.93(45)	4	0.00			
11(9, 2) - 12(8, 5)	*AE*		269898.05(18)	6	1.0			
11(7, 4) - 12(6, 7)	*AA*		152891.88(35)	10	1.0	0.636	84.52	
11(7, 4) - 12(6, 7)	*EE*		152893.19(6)	16	0.01			
11(7, 4) - 12(6, 7)	*EA*		152894.51(12)	4	0.00			
11(7, 4) - 12(6, 7)	*AE*		152889.07(8)	6	1.0			
11(5, 6) - 12(4, 9)	*AA*		35135.38(8)	10	1.0	1.174	65.02	
11(5, 6) - 12(4, 9)	*EE*		35135.54(1)	16	0.61			
11(5, 6) - 12(4, 9)	*EA*		35136.50(4)	4	0.61			
11(5, 6) - 12(4, 9)	*AE*		35128.54(18)	6	1.0			
12(2,11) - 11(3, 8)	*AA*	70984.90 (10)	70984.80(7)	10	1.0	1.568	50.65	
12(2,11) - 11(3, 8)	*EE*	70987.89 (10)	70987.78(8)	16	1.0			
12(2,11) - 11(3, 8)	*EA*	70990.85 (10)	70990.75(16)	4	1.0			
12(2,11) - 11(3, 8)	*AE*	70990.85 (10)	70990.80(17)	6	1.0			
12(5, 7) - 12(4, 8)	*AA*		262769.72(28)	6	1.0	5.742	65.02	
12(5, 7) - 12(4, 8)	*EE*		262768.94(1)	16	0.69			
12(5, 7) - 12(4, 8)	*EA*		262768.89(3)	2	0.52			
12(5, 7) - 12(4, 8)	*AE*		262763.13(21)	4	1.0			
12(3, 9) - 12(2,10)	*AA*		129561.90(17)	6	1.0	7.371	53.97	
12(3, 9) - 12(2,10)	*EE*		129559.03(14)	16	1.0			
12(3, 9) - 12(2,10)	*EA*		129556.18(28)	2	1.0			
12(3, 9) - 12(2,10)	*AE*		129556.15(28)	4	1.0			
12(1,11) - 12(0,12)	*AA*	93668.45 (20)	93668.35(9)	6	1.0	5.535	48.32	
12(1,11) - 12(0,12)	*EE*		93666.65(12)	16	1.0			
12(1,11) - 12(0,12)	*EA*	93664.71 (10)	93664.94(26)	2	1.0			
12(1,11) - 12(0,12)	*AE*	93664.71 (10)	93664.94(26)	2	1.0			
12(4, 8) - 12(3, 9)	*AA*		201543.09(23)	6	1.0	6.235	58.30	
12(4, 8) - 12(3, 9)	*EE*		201539.79(10)	16	1.0			
12(4, 8) - 12(3, 9)	*EA*		201536.76(20)	2	1.0			
12(4, 8) - 12(3, 9)	*AE*		201536.15(24)	4	1.0			
12(2,10) - 12(1,11)	*AA*		75909.64(5)	6	1.0	0.101	51.44	
12(2,10) - 12(1,11)	*EE*		75908.03(3)	16	1.0			
12(2,10) - 12(1,11)	*EA*		75906.42(7)	2	1.0			
12(2,10) - 12(1,11)	*AE*		75906.42(7)	4	1.0			
12(4, 9) - 12(3,10)	*AA*		204525.03(21)	10	1.0	6.198	58.19	
12(4, 9) - 12(3,10)	*EE*		204521.42(12)	16	1.0			
12(4, 9) - 12(3,10)	*EA*		204517.51(25)	4	1.0			
12(4, 9) - 12(3,10)	*AE*		204518.12(21)	6	1.0			
12(2,11) - 12(1,12)	*AA*		135269.67(15)	10	1.0	4.424	48.51	
12(2,11) - 12(1,12)	*EE*		135266.78(7)	16	1.0			
12(2,11) - 12(1,12)	*EA*		135263.89(15)	4	1.0			
12(2,11) - 12(1,12)	*AE*		135263.89(15)	6	1.0			
12(5, 8) - 12(4, 9)	*AA*		262895.29(28)	6	1.0	5.741	65.02	
12(5, 8) - 12(4, 9)	*EE*		262889.46(19)	16	0.64			
12(5, 8) - 12(4, 9)	*EA*		262882.91(39)	2	0.52			
12(5, 8) - 12(4, 9)	*AE*		262888.70(21)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
12(3,10) - 12(2,11)	*AA*		155131.65(14)	10	1.0	6.327	53.02	
12(3,10) - 12(2,11)	*EE*		155128.56(8)	16	1.0			
12(3,10) - 12(2,11)	*EA*		155125.45(16)	4	1.0			
12(3,10) - 12(2,11)	*AE*		155125.46(16)	6	1.0			
12(9, 4) - 13(8, 5)	*AA*		250893.24(90)	10	1.0	0.392	120.07	
12(9, 4) - 13(8, 5)	*EE*		250889.65(4)	16	0.00			
12(9, 4) - 13(8, 5)	*EA*		250886.05(8)	4	0.00			
12(9, 4) - 13(8, 5)	*AE*		250896.62(20)	6	1.0			
12(7, 6) - 13(6, 7)	*AA*		133810.64(34)	6	1.0	0.820	92.75	
12(7, 6) - 13(6, 7)	*EE*		133806.70(5)	16	0.00			
12(7, 6) - 13(6, 7)	*EA*		133802.67(12)	2	0.00			
12(7, 6) - 13(6, 7)	*AE*		133807.89(7)	4	1.0			
12(5, 8) - 13(4, 9)	*AA*		15581.38(8)	10	1.0	1.387	73.26	
12(5, 8) - 13(4, 9)	*EE*		15575.26(21)	16	0.65			
12(5, 8) - 13(4, 9)	*EA*		15567.97(45)	4	0.55			
12(5, 8) - 13(4, 9)	*AE*		15574.69(21)	6	1.0			
13(2,11) - 12(3,10)	*AA*		126218.31(8)	10	1.0	2.220	58.19	
13(2,11) - 12(3,10)	*EE*		126220.95(17)	16	1.0			
13(2,11) - 12(3,10)	*EA*		126223.61(35)	4	1.0			
13(2,11) - 12(3,10)	*AE*		126223.59(35)	6	1.0			
13(0,13) - 12(1,12)	*AA*		231987.79(13)	10	1.0	0.024	48.51	
13(0,13) - 12(1,12)	*EE*		231987.87(2)	16	1.0			
13(0,13) - 12(1,12)	*EA*		231987.95(5)	4	1.0			
13(0,13) - 12(1,12)	*AE*		231987.95(5)	6	1.0			
12(8, 5) - 13(7, 6)	*AA*		192423.80(58)	6	1.0	0.587	105.43	
12(8, 5) - 13(7, 6)	*EE*		192421.77(4)	16	1.0			
12(8, 5) - 13(7, 6)	*EA*		192419.77(9)	2	1.0			
12(8, 5) - 13(7, 6)	*AE*		192423.99(10)	4	1.0			
12(6, 7) - 13(5, 8)	*AA*		74975.87(17)	10	1.0	1.089	82.02	
12(6, 7) - 13(5, 8)	*EE*		74969.18(19)	16	0.12			
12(6, 7) - 13(5, 8)	*EA*		74961.03(44)	4	0.04			
12(6, 7) - 13(5, 8)	*AE*		74970.62(11)	6	1.0			
13(3,10) - 12(4, 9)	*AA*		47374.42(6)	10	1.0	1.703	65.02	
13(3,10) - 12(4, 9)	*EE*		47377.97(14)	16	1.0			
13(3,10) - 12(4, 9)	*EA*		47381.84(31)	4	1.0			
13(3,10) - 12(4, 9)	*AE*		47381.20(27)	6	1.0			
13(1,12) - 12(2,11)	*AA*		202490.54(10)	10	1.0	4.543	53.02	
13(1,12) - 12(2,11)	*EE*		202491.60(11)	16	1.0			
13(1,12) - 12(2,11)	*EA*		202492.66(23)	4	1.0			
13(1,12) - 12(2,11)	*AE*		202492.66(23)	6	1.0			
13(1,13) - 12(0,12)	*AA*		241946.86(15)	6	1.0	0.114	48.32	
13(1,13) - 12(0,12)	*EE*		241946.55(2)	16	1.0			
13(1,13) - 12(0,12)	*EA*		241946.23(4)	2	1.0			
13(1,13) - 12(0,12)	*AE*		241946.23(4)	4	1.0			
13(2,12) - 12(1,11)	*AA*		291444.67(28)	6	1.0	5.436	51.44	
13(2,12) - 12(1,11)	*EE*		291443.09(9)	16	1.0			
13(2,12) - 12(1,11)	*EA*		291441.52(19)	2	1.0			
13(2,12) - 12(1,11)	*AE*		291441.52(19)	4	1.0			
12(8, 4) - 13(7, 7)	*AA*		192423.80(58)	6	1.0	0.587	105.43	
12(8, 4) - 13(7, 7)	*EE*		192425.99(10)	16	1.0			
12(8, 4) - 13(7, 7)	*EA*		192428.18(21)	2	1.0			
12(8, 4) - 13(7, 7)	*AE*		192423.99(10)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
12(6, 6) - 13(5, 9)	AA		74982.07(17)	6	1.0	1.089	82.02	
12(6, 6) - 13(5, 9)	EE		74983.54(8)	16	0.12			
12(6, 6) - 13(5, 9)	EA		74986.45(21)	2	0.04			
12(6, 6) - 13(5, 9)	AE		74976.82(11)	4	1.0			
13(3,11) - 12(4, 8)	AA		42365.54(4)	6	1.0	1.683	65.02	
13(3,11) - 12(4, 8)	EE		42368.73(11)	16	1.0			
13(3,11) - 12(4, 8)	EA		42371.60(20)	2	1.0			
13(3,11) - 12(4, 8)	AE		42372.26(24)	4	1.0			
13(1,13) - 12(2,10)	AA		72368.87(10)	6	1.0	0.501	53.97	
13(1,13) - 12(2,10)	EE		72371.87(14)	16	1.0			
13(1,13) - 12(2,10)	EA		72374.87(29)	2	1.0			
13(1,13) - 12(2,10)	AE		72374.87(29)	4	1.0			
12(9, 3) - 13(8, 6)	AA		250893.24(90)	6	1.0	0.392	120.07	
12(9, 3) - 13(8, 6)	EE		250900.21(24)	16	0.00			
12(9, 3) - 13(8, 6)	EA		250907.18(49)	2	0.00			
12(9, 3) - 13(8, 6)	AE		250896.62(20)	4	1.0			
12(7, 5) - 13(6, 8)	AA		133810.74(34)	6	1.0	0.820	92.75	
12(7, 5) - 13(6, 8)	EE		133811.96(6)	16	0.00			
12(7, 5) - 13(6, 8)	EA		133813.24(13)	2	0.00			
12(7, 5) - 13(6, 8)	AE		133807.99(7)	4	1.0			
12(5, 7) - 13(4,10)	AA		15824.90(7)	6	1.0	1.387	73.26	
12(5, 7) - 13(4,10)	EE		15824.34(1)	16	0.65			
12(5, 7) - 13(4,10)	EA		15824.99(2)	2	0.55			
12(5, 7) - 13(4,10)	AE		15818.28(20)	4	1.0			
13(2,12) - 12(3, 9)	AA	85973.216(100)	85973.13(9)	6	1.0	1.656	58.30	
13(2,12) - 12(3, 9)	EE	85976.096(100)	85976.04(8)	16	1.0			
13(2,12) - 12(3, 9)	EA	85978.94 (10)	85978.91(16)	4	1.0			
13(2,12) - 12(3, 9)	AE	85978.94 (10)	85978.94(16)	2	1.0			
13(5, 8) - 13(4, 9)	AA		262394.92(33)	10	1.0	6.370	73.26	
13(5, 8) - 13(4, 9)	EE		262393.39(3)	16	0.83			
13(5, 8) - 13(4, 9)	EA		262393.17(2)	4	0.72			
13(5, 8) - 13(4, 9)	AE		262388.55(22)	6	1.0			
13(3,10) - 13(2,11)	AA		125681.13(19)	10	1.0	8.359	62.40	
13(3,10) - 13(2,11)	EE		125678.43(15)	16	1.0			
13(3,10) - 13(2,11)	EA		125675.74(29)	4	1.0			
13(3,10) - 13(2,11)	AE		125675.72(30)	6	1.0			
13(1,12) - 13(0,13)	AA		105772.41(12)	10	1.0	5.405	56.24	
13(1,12) - 13(0,13)	EE		105770.50(14)	16	1.0			
13(1,12) - 13(0,13)	EA		105768.60(29)	4	1.0			
13(1,12) - 13(0,13)	AE		105768.60(29)	6	1.0			
13(4, 9) - 13(3,10)	AA		199939.50(28)	10	1.0	6.890	66.60	
13(4, 9) - 13(3,10)	EE		199936.25(12)	16	1.0			
13(4, 9) - 13(3,10)	EA		199933.11(25)	4	1.0			
13(4, 9) - 13(3,10)	AE		199932.81(26)	6	1.0			
13(2,11) - 13(1,12)	AA		78859.43(6)	10	1.0	0.801	59.77	
13(2,11) - 13(1,12)	EE		78857.91(2)	16	1.0			
13(2,11) - 13(1,12)	EA		78856.40(4)	4	1.0			
13(2,11) - 13(1,12)	AE		78856.40(4)	6	1.0			
13(4,10) - 13(3,11)	AA		204579.28(25)	6	1.0	6.823	66.43	
13(4,10) - 13(3,11)	EE		204575.87(12)	16	1.0			
13(4,10) - 13(3,11)	EA		204572.29(27)	2	1.0			
13(4,10) - 13(3,11)	AE		204572.59(25)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
13(2,12) - 13(1,13)	*AA*		143166.16(20)	6	1.0	4.560	56.39	
13(2,12) - 13(1,13)	*EE*		143163.19(8)	16	1.0			
13(2,12) - 13(1,13)	*EA*		143160.22(17)	2	1.0			
13(2,12) - 13(1,13)	*AE*		143160.22(17)	4	1.0			
13(5, 9) - 13(4,10)	*AA*		262629.54(33)	6	1.0	6.368	73.26	
13(5, 9) - 13(4,10)	*EE*		262624.70(18)	16	0.83			
13(5, 9) - 13(4,10)	*EA*		262618.60(39)	2	0.72			
13(5, 9) - 13(4,10)	*AE*		262623.23(20)	4	1.0			
13(3,11) - 13(2,12)	*AA*		157935.50(17)	6	1.0	6.824	61.16	
13(3,11) - 13(2,12)	*EE*		157932.48(7)	16	1.0			
13(3,11) - 13(2,12)	*EA*		157929.45(15)	2	1.0			
13(3,11) - 13(2,12)	*AE*		157929.47(15)	4	1.0			
13(9, 5) - 14(8, 6)	*AA*		231879.38(89)	6	1.0	0.546	128.93	
13(9, 5) - 14(8, 6)	*EE*		231875.82(6)	16	1.0			
13(9, 5) - 14(8, 6)	*EA*		231872.29(11)	2	1.0			
13(9, 5) - 14(8, 6)	*AE*		231882.57(19)	4	1.0			
13(7, 7) - 14(6, 8)	*AA*		114698.82(33)	6	1.0	1.014	101.61	
13(7, 7) - 14(6, 8)	*EE*		114695.04(7)	16	0.01			
13(7, 7) - 14(6, 8)	*EA*		114691.13(15)	2	0.00			
13(7, 7) - 14(6, 8)	*AE*		114696.07(6)	4	1.0			
14(4,10) - 13(5, 9)	*AA*		3982.67(8)	6	1.0	1.603	82.02	
14(4,10) - 13(5, 9)	*EE*		3987.64(19)	16	0.81			
14(4,10) - 13(5, 9)	*EA*		3994.14(43)	2	0.67			
14(4,10) - 13(5, 9)	*AE*		3989.05(22)	4	1.0			
14(2,12) - 13(3,11)	*AA*		151510.97(8)	6	1.0	2.540	66.43	
14(2,12) - 13(3,11)	*EE*		151513.41(18)	16	1.0			
14(2,12) - 13(3,11)	*EA*		151515.86(37)	2	1.0			
14(2,12) - 13(3,11)	*AE*		151515.85(37)	4	1.0			
14(0,14) - 13(1,13)	*AA*		250925.01(17)	6	1.0	1.073	56.39	
14(0,14) - 13(1,13)	*EE*		250925.04(2)	16	.			
14(0,14) - 13(1,13)	*EA*		250925.07(4)	2	1.0			
14(0,14) - 13(1,13)	*AE*		250925.07(4)	4	1.0			
13(10, 4) - 14(9, 5)	*AA*		290256.17(130)	6	1.0	0.364	145.52	
13(10, 4) - 14(9, 5)	*EE*		290250.92(10)	16	0.00			
13(10, 4) - 14(9, 5)	*EA*		290245.67(19)	2	0.00			
13(10, 4) - 14(9, 5)	*AE*		290261.92(24)	4	1.0			
13(8, 6) - 14(7, 7)	*AA*		173373.21(57)	6	1.0	0.763	114.29	
13(8, 6) - 14(7, 7)	*EE*		173371.24(4)	16	1.0			
13(8, 6) - 14(7, 7)	*EA*		173369.34(8)	2	1.0			
13(8, 6) - 14(7, 7)	*AE*		173373.40(10)	4	1.0			
13(6, 8) - 14(5, 9)	*AA*		55748.08(17)	6	1.0	1.296	90.89	
13(6, 8) - 14(5, 9)	*EE*		55742.46(17)	16	0.27			
13(6, 8) - 14(5, 9)	*EA*		55735.42(42)	2	0.14			
13(6, 8) - 14(5, 9)	*AE*		55743.02(10)	4	1.0			
14(3,11) - 13(4,10)	*AA*		68779.63(7)	6	1.0	1.919	73.26	
14(3,11) - 13(4,10)	*EE*		68782.97(16)	16	1.0			
14(3,11) - 13(4,10)	*EA*		68786.54(34)	2	1.0			
14(3,11) - 13(4,10)	*AE*		68786.19(32)	4	1.0			
14(1,13) - 13(2,12)	*AA*		226346.00(13)	6	1.0	5.332	61.16	
14(1,13) - 13(2,12)	*EE*		226346.89(12)	16	1.0			
14(1,13) - 13(2,12)	*EA*		226347.78(24)	2	1.0			
14(1,13) - 13(2,12)	*AE*		226347.78(24)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
14(1,14) - 13(0,13)	*AA*		258549.30(19)	10	1.0	1.134	56.24	
14(1,14) - 13(0,13)	*EE*		258549.04(1)	16	1.0			
14(1,14) - 13(0,13)	*EA*		258548.77(3)	4	1.0			
14(1,14) - 13(0,13)	*AE*		258548.77(3)	6	1.0			
13(10, 3) - 14(9, 6)	*AA*		290256.17(130)	10	1.0	0.364	145.52	
13(10, 3) - 14(9, 6)	*EE*		290267.17(34)	16	0.00			
13(10, 3) - 14(9, 6)	*EA*		290278.17(68)	4	0.00			
13(10, 3) - 14(9, 6)	*AE*		290261.92(24)	6	1.0			
13(8, 5) - 14(7, 8)	*AA*		173373.22(57)	10	1.0	0.763	114.29	
13(8, 5) - 14(7, 8)	*EE*		173375.38(11)	16	1.0			
13(8, 5) - 14(7, 8)	*EA*		173377.47(22)	4	1.0			
13(8, 5) - 14(7, 8)	*AE*		173373.41(10)	6	1.0			
13(6, 7) - 14(5,10)	*AA*		55761.12(17)	10	1.0	1.296	90.89	
13(6, 7) - 14(5,10)	*EE*		55761.68(6)	16	0.27			
13(6, 7) - 14(5,10)	*EA*		55763.65(20)	4	0.14			
13(6, 7) - 14(5,10)	*AE*		55756.06(10)	6	1.0			
14(3,12) - 13(4, 9)	*AA*		61179.77(5)	10	1.0	1.883	73.26	
14(3,12) - 13(4, 9)	*EE*		61182.86(11)	16	1.0			
14(3,12) - 13(4, 9)	*EA*		61185.83(22)	4	1.0			
14(3,12) - 13(4, 9)	*AE*		61186.15(23)	6	1.0			
14(1,14) - 13(2,11)	*AA*		73917.46(10)	10	1.0	0.438	62.40	
14(1,14) - 13(2,11)	*EE*		73920.62(17)	16	1.0			
14(1,14) - 13(2,11)	*EA*		73923.77(34)	4	1.0			
14(1,14) - 13(2,11)	*AE*		73923.77(34)	6	1.0			
13(9, 4) - 14(8, 7)	*AA*		231879.38(89)	10	1.0	0.546	128.93	
13(9, 4) - 14(8, 7)	*EE*		231886.10(25)	16	1.0			
13(9, 4) - 14(8, 7)	*EA*		231892.82(50)	4	1.0			
13(9, 4) - 14(8, 7)	*AE*		231882.57(19)	6	1.0			
13(7, 6) - 14(6, 9)	*AA*		114699.05(33)	10	1.0	1.014	101.61	
13(7, 6) - 14(6, 9)	*EE*		114700.11(7)	16	0.01			
13(7, 6) - 14(6, 9)	*EA*		114701.27(15)	4	0.00			
13(7, 6) - 14(6, 9)	*AE*		114696.30(6)	6	1.0			
14(4,11) - 13(5, 8)	*AA*		3546.70(7)	10	1.0	1.602	82.02	
14(4,11) - 13(5, 8)	*EE*		3548.11(1)	16	0.81			
14(4,11) - 13(5, 8)	*EA*		3547.98(0)	4	0.67			
14(4,11) - 13(5, 8)	*AE*		3553.08(21)	6	1.0			
14(2,13) - 13(3,10)	*AA*		99833.50(12)	10	1.0	1.701	66.60	
14(2,13) - 13(3,10)	*EE*		99836.30(7)	16	1.0			
14(2,13) - 13(3,10)	*EA*		99839.08(14)	4	1.0			
14(2,13) - 13(3,10)	*AE*		99839.09(14)	6	1.0			
14(5, 9) - 14(4,10)	*AA*		261899.52(39)	6	1.0	7.000	82.15	
14(5, 9) - 14(4,10)	*EE*		261897.33(6)	16	0.94			
14(5, 9) - 14(4,10)	*EA*		261896.36(7)	2	0.85			
14(5, 9) - 14(4,10)	*AE*		261893.39(25)	4	1.0			
14(3,11) - 14(2,12)	*AA*		121847.95(21)	6	1.0	9.442	71.49	
14(3,11) - 14(2,12)	*EE*		121845.45(15)	16	1.0			
14(3,11) - 14(2,12)	*EA*		121842.98(30)	2	1.0			
14(3,11) - 14(2,12)	*AE*		121842.95(30)	4	1.0			
14(1,13) - 14(0,14)	*AA*		118587.14(16)	6	1.0	5.289	64.76	
14(1,13) - 14(0,14)	*EE*		118585.03(16)	16	1.0			
14(1,13) - 14(0,14)	*EA*		118582.92(32)	2	1.0			
14(1,13) - 14(0,14)	*AE*		118582.92(32)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
14(4,10) - 14(3,11)	AA		197832.57(33)	6	1.0	7.563	75.55	
14(4,10) - 14(3,11)	EE		197829.35(15)	16	1.0			
14(4,10) - 14(3,11)	EA		197826.20(30)	2	1.0			
14(4,10) - 14(3,11)	AE		197826.07(30)	4	1.0			
14(2,12) - 14(1,13)	AA	83100.44 (10)	83100.47(7)	6	1.0	1.310	68.71	
14(2,12) - 14(1,13)	EE	83098.92 (10)	83099.00(2)	16	1.0			
14(2,12) - 14(1,13)	EA	83097.38 (10)	83097.53(4)	4	1.0			
14(2,12) - 14(1,13)	AE	83097.38 (10)	83097.53(4)	2	1.0			
14(4,11) - 14(3,12)	AA		204761.85(29)	10	1.0	7.448	75.31	
14(4,11) - 14(3,12)	EE		204758.63(12)	16	1.0			
14(4,11) - 14(3,12)	EA		204755.32(25)	4	1.0			
14(4,11) - 14(3,12)	AE		204755.47(24)	6	1.0			
14(2,13) - 14(1,14)	AA		151597.18(25)	10	1.0	4.669	64.87	
14(2,13) - 14(1,14)	EE		151594.12(9)	16	1.0			
14(2,13) - 14(1,14)	EA		151591.05(18)	4	1.0			
14(2,13) - 14(1,14)	AE		151591.05(18)	6	1.0			
14(5,10) - 14(4,11)	AA		262316.39(39)	10	1.0	6.996	82.14	
14(5,10) - 14(4,11)	EE		262312.45(17)	16	0.94			
14(5,10) - 14(4,11)	EA		262307.30(42)	4	0.85			
14(5,10) - 14(4,11)	AE		262310.27(24)	6	1.0			
14(3,12) - 14(2,13)	AA		161285.76(19)	10	1.0	7.287	69.93	
14(3,12) - 14(2,13)	EE		161282.81(8)	16	1.0			
14(3,12) - 14(2,13)	EA		161279.85(17)	4	1.0			
14(3,12) - 14(2,13)	AE		161279.85(17)	6	1.0			
14(9, 6) - 15(8, 7)	AA		212851.15(88)	10	1.0	0.712	138.42	
14(9, 6) - 15(8, 7)	EE		212847.62(7)	16	1.0			
14(9, 6) - 15(8, 7)	EA		212844.06(17)	4	1.0			
14(9, 6) - 15(8, 7)	AE		212854.09(16)	6	1.0			
14(7, 8) - 15(6, 9)	AA		95551.94(33)	10	1.0	1.214	111.10	
14(7, 8) - 15(6, 9)	EE		95548.44(10)	16	1.0			
14(7, 8) - 15(6, 9)	EA		95544.69(19)	4	1.0			
14(7, 8) - 15(6, 9)	AE		95549.19(5)	6	1.0			
15(4,11) - 14(5,10)	AA		23723.11(8)	10	1.0	1.819	90.89	
15(4,11) - 14(5,10)	EE		23727.14(18)	16	0.94			
15(4,11) - 14(5,10)	EA		23732.52(44)	4	0.84			
15(4,11) - 14(5,10)	AE		23729.30(26)	6	1.0			
15(2,13) - 14(3,12)	AA		177347.03(10)	10	1.0	2.899	75.31	
15(2,13) - 14(3,12)	EE		177349.28(21)	16	1.0			
15(2,13) - 14(3,12)	EA		177351.53(42)	4	1.0			
15(2,13) - 14(3,12)	AE		177351.53(42)	6	1.0			
15(0,15) - 14(1,14)	AA		269608.73(21)	10	1.0	2.116	64.87	
15(0,15) - 14(1,14)	EE		269608.71(2)	16	1.0			
15(0,15) - 14(1,14)	EA		269608.70(4)	4	1.0			
15(0,15) - 14(1,14)	AE		269608.70(4)	6	1.0			
14(10, 5) - 15(9, 6)	AA		271256.47(129)	10	1.0	0.509	155.01	
14(10, 5) - 15(9, 6)	EE		271251.34(11)	16	1.0			
14(10, 5) - 15(9, 6)	EA		271246.16(24)	4	1.0			
14(10, 5) - 15(9, 6)	AE		271261.84(22)	6	1.0			
14(8, 7) - 15(7, 8)	AA		154300.61(56)	10	1.0	0.948	123.78	
14(8, 7) - 15(7, 8)	EE		154298.73(3)	16	0.01			
14(8, 7) - 15(7, 8)	EA		154296.89(6)	4	0.01			
14(8, 7) - 15(7, 8)	AE		154300.73(12)	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
14(6, 9) - 15(5,10)	AA		36457.66(17)	10	1.0	1.508	100.39	
14(6, 9) - 15(5,10)	EE		36452.72(17)	16	0.40			
14(6, 9) - 15(5,10)	EA		36446.88(40)	4	0.28			
14(6, 9) - 15(5,10)	AE		36452.79(13)	6	1.0			
15(3,12) - 14(4,11)	AA	90889.20 (23)	90888.97(8)	10	1.0	2.134	82.14	
15(3,12) - 14(4,11)	EE	90892.26 (23)	90892.13(18)	16	1.0			
15(3,12) - 14(4,11)	EA	90895.32 (23)	90895.41(36)	4	1.0			
15(3,12) - 14(4,11)	AE	90895.32 (23)	90895.22(35)	6	1.0			
15(1,14) - 14(2,13)	AA		249923.61(17)	10	1.0	6.200	69.93	
15(1,14) - 14(2,13)	EE		249924.31(11)	16	1.0			
15(1,14) - 14(2,13)	EA		249925.02(23)	4	1.0			
15(1,14) - 14(2,13)	AE		249925.02(23)	6	1.0			
15(1,15) - 14(0,14)	AA		275382.06(23)	6	1.0	2.158	64.76	
15(1,15) - 14(0,14)	EE		275381.82(1)	16	1.0			
15(1,15) - 14(0,14)	EA		275381.59(2)	2	1.0			
15(1,15) - 14(0,14)	AE		275381.59(2)	4	1.0			
14(10, 4) - 15(9, 7)	AA		271256.47(129)	6	1.0	0.509	155.01	
14(10, 4) - 15(9, 7)	EE		271266.97(33)	16	1.0			
14(10, 4) - 15(9, 7)	EA		271277.53(68)	2	1.0			
14(10, 4) - 15(9, 7)	AE		271261.84(22)	4	1.0			
14(8, 6) - 15(7, 9)	AA		154300.62(56)	6	1.0	0.948	123.78	
14(8, 6) - 15(7, 9)	EE		154302.65(13)	16	0.01			
14(8, 6) - 15(7, 9)	EA		154304.62(25)	2	0.01			
14(8, 6) - 15(7, 9)	AE		154300.74(12)	4	1.0			
14(6, 8) - 15(5,11)	AA		36483.64(17)	6	1.0	1.508	100.39	
14(6, 8) - 15(5,11)	EE		36483.70(4)	16	0.42			
14(6, 8) - 15(5,11)	EA		36484.67(13)	2	0.28			
14(6, 8) - 15(5,11)	AE		36478.77(13)	4	1.0			
15(3,13) - 14(4,10)	AA		79753.49(7)	6	1.0	2.071	82.15	
15(3,13) - 14(4,10)	EE		79756.55(13)	16	1.0			
15(3,13) - 14(4,10)	EA		79759.52(27)	2	1.0			
15(3,13) - 14(4,10)	AE		79759.68(27)	4	1.0			
15(1,15) - 14(2,12)	AA		73694.44(10)	6	1.0	0.372	71.49	
15(1,15) - 14(2,12)	EE		73697.78(19)	16	1.0			
15(1,15) - 14(2,12)	EA		73701.13(38)	2	1.0			
15(1,15) - 14(2,12)	AE		73701.13(38)	4	1.0			
14(9, 5) - 15(8, 8)	AA		212851.15(88)	6	1.0	0.712	138.42	
14(9, 5) - 15(8, 8)	EE		212857.62(24)	16	1.0			
14(9, 5) - 15(8, 8)	EA		212864.12(50)	2	1.0			
14(9, 5) - 15(8, 8)	AE		212854.09(16)	4	1.0			
14(7, 7) - 15(6,10)	AA		95552.49(33)	6	1.0	1.214	111.10	
14(7, 7) - 15(6,10)	EE		95553.24(6)	16	0.97			
14(7, 7) - 15(6,10)	EA		95554.24(13)	2	1.0			
14(7, 7) - 15(6,10)	AE		95549.74(5)	4	1.0			
15(4,12) - 14(5, 9)	AA		22975.29(7)	6	1.0	1.817	90.89	
15(4,12) - 14(5, 9)	EE		22977.42(5)	16	0.94			
15(4,12) - 14(5, 9)	EA		22978.23(5)	2	0.85			
15(4,12) - 14(5, 9)	AE		22981.42(24)	4	1.0			
15(2,14) - 14(3,11)	AA		112371.39(16)	6	1.0	1.701	75.55	
15(2,14) - 14(3,11)	EE		112374.08(6)	16	1.0			
15(2,14) - 14(3,11)	EA		112376.73(12)	2	1.0			
15(2,14) - 14(3,11)	AE		112376.76(12)	4	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
15(5,10) - 15(4,11)	*AA*		261250.17(46)	10	1.0	7.633	91.68	
15(5,10) - 15(4,11)	*EE*		261247.64(10)	16	0.98			
15(5,10) - 15(4,11)	*EA*		261245.89(14)	4	0.94			
15(5,10) - 15(4,11)	*AE*		261244.29(26)	6	1.0			
15(3,12) - 15(2,13)	*AA*		118303.79(22)	10	1.0	0.610	81.22	
15(3,12) - 15(2,13)	*EE*		118301.48(15)	16	1.0			
15(3,12) - 15(2,13)	*EA*		118299.20(31)	4	1.0			
15(3,12) - 15(2,13)	*AE*		118299.17(31)	6	1.0			
15(1,14) - 15(0,15)	*AA*		131912.06(22)	10	1.0	5.196	73.86	
15(1,14) - 15(0,15)	*EE*		131909.72(17)	16	1.0			
15(1,14) - 15(0,15)	*EA*		131907.37(35)	4	1.0			
15(1,14) - 15(0,15)	*AE*		131907.37(35)	6	1.0			
15(4,11) - 15(3,12)	*AA*		195150.53(39)	10	1.0	8.265	85.17	
15(4,11) - 15(3,12)	*EE*		195147.47(17)	16	1.0			
15(4,11) - 15(3,12)	*EA*		195144.40(34)	4	1.0			
15(4,11) - 15(3,12)	*AE*		195144.34(34)	6	1.0			
15(2,13) - 15(1,14)	*AA*	88709.072(100)	88709.19(8)	10	1.0	1.623	78.26	
15(2,13) - 15(1,14)	*EE*	88707.644(100)	88707.78(4)	16	1.0			
15(2,13) - 15(1,14)	*EA*	88706.216(100)	88706.38(8)	4	1.0			
15(2,13) - 15(1,14)	*AE*	88706.216(100)	88706.38(8)	6	1.0			
15(4,12) - 15(3,13)	*AA*		205121.32(33)	6	1.0	8.073	84.81	
15(4,12) - 15(3,13)	*EE*		205118.20(15)	16	1.0			
15(4,12) - 15(3,13)	*EA*		205115.07(29)	2	1.0			
15(4,12) - 15(3,13)	*AE*		205115.13(29)	4	1.0			
15(2,14) - 15(1,15)	*AA*		160524.90(32)	6	1.0	4.755	73.94	
15(2,14) - 15(1,15)	*EE*		160521.74(10)	16	1.0			
15(2,14) - 15(1,15)	*EA*		160518.59(20)	2	1.0			
15(2,14) - 15(1,15)	*AE*		160518.59(20)	4	1.0			
15(5,11) - 15(4,12)	*AA*		261959.30(45)	6	1.0	7.627	91.65	
15(5,11) - 15(4,12)	*EE*		261955.99(14)	16	0.98			
15(5,11) - 15(4,12)	*EA*		261951.86(36)	2	0.94			
15(5,11) - 15(4,12)	*AE*		261953.49(25)	4	1.0			
15(3,13) - 15(2,14)	*AA*		165214.67(23)	6	1.0	7.713	79.30	
15(3,13) - 15(2,14)	*EE*		165211.83(7)	16	1.0			
15(3,13) - 15(2,14)	*EA*		165208.98(15)	2	1.0			
15(3,13) - 15(2,14)	*AE*		165208.98(15)	4	1.0			
16(1,16) - 15(2,13)	*AA*	71791.23 (20)	71791.25(10)	10	1.0	0.316	81.22	
16(1,16) - 15(2,13)	*EE*	71795.14 (20)	( )	16	1.0			
16(1,16) - 15(2,13)	*EA*	71799.00 (20)	( )	4	1.0			
16(1,16) - 15(2,13)	*AE*	71799.00 (20)	( )	6	1.0			
17(2,15) - 17(1,16)	*AA*	104178.80 (20)	104178.75(13)	10	1.0	11.722	99.15	
17(2,15) - 17(1,16)	*EE*	104177.37 (20)	( )	16	1.0			
17(2,15) - 17(1,16)	*EA*	104175.92 (20)	( )	4	1.0			
17(2,15) - 17(1,16)	*AE*	104175.92 (20)	( )	6	1.0			
17(1,17) - 16(2,14)	*AA*	68323.70 (10)	68323.67(14)	6	1.0	0.270	91.60	
17(1,17) - 16(2,14)	*EE*	68327.80 (10)	( )	16	1.0			
17(1,17) - 16(2,14)	*EA*	68331.85 (10)	( )	4	1.0			
17(1,17) - 16(2,14)	*AE*	68331.85 (10)	( )	2	1.0			
18(4,15) - 17(5,12)	*AA*	81467.60 (10)	81467.73(9)	10	1.0	2.449	121.31	
18(4,15) - 17(5,12)	*EE*	81469.94 (10)	( )	16	1.0			
18(4,15) - 17(5,12)	*EA*	81472.35 (10)	( )	4	1.0			
18(4,15) - 17(5,12)	*AE*	81472.35 (10)	( )	6	1.0			

TABLE 5. The microwave spectrum for the ground torsional state of $^{12}C_3{}^{16}O^{12}CH_3$—Continued

$J'(K'_-,K'_+) - J''(K''_-,K''_+)$	Sym.	Measured frequency (MHz)	Calculated frequency (MHz)	Spin wt.	Rel. int.	Line strength	Energy lower state	Reference
18(4,14) - 17(5,13)	*AA*	84527.06 (10)	84527.12(10)	6	1.0	2.459	121.31	
18(4,14) - 17(5,13)	*EE*	84529.64 (10)	( )	16	1.0			
18(4,14) - 17(5,13)	*EA*	84532.22 (10)	( )	4	1.0			
18(4,14) - 17(5,13)	*AE*	84532.22 (10)	( )	2	1.0			
19(4,16) - 18(5,13)	*AA*	100946.88 (10)	100946.91(11)	6	1.0	2.650	132.73	
19(4,16) - 18(5,13)	*EE*	100949.04 (10)	( )	16	1.0			
19(4,16) - 18(5,13)	*EA*	100951.97 (10)	( )	4	1.0			
19(4,16) - 18(5,13)	*AE*	100951.97 (10)	( )	2	1.0			
22(5,18) - 21(6,15)	*AA*	100436.82 (20)	100435.76(20)	10	1.0	3.004	181.44	
22(5,18) - 21(6,15)	*EE*	100435.50 (20)	( )	16	1.0			
22(5,18) - 21(6,15)	*EA*	100434.20 (20)	( )	4	1.0			
22(5,18) - 21(6,15)	*AE*	100434.20 (20)	( )	6	1.0			

Table 6. Measured "forbidden" transitions for $^{12}CH_3{}^{16}O^{12}CH_3$.

"Forbidden" Transition $J'_{K'_-,K'_+} - J''_{K''_-,K''_+}$	Torsional Substate	Connected Allowed Transition $J'_{K'_-,K'_+} - J''_{K''_-,K''_+}$	Measured Frequency (MHz)	Relative Intensity[a]
$5_{4,2} - 6_{3,4}$	EA	$5_{4,2} - 6_{3,3}$	91 223.27(10)	0.67
	EE		91 230.91(10)	0.58
$5_{4,1} - 6_{3,3}$	EE	$5_{4,1} - 6_{3,4}$	91 185.23(10)	0.67
	EA			0.58
$6_{4,2} - 7_{3,4}$	EE	$6_{4,2} - 7_{3,5}$	72 035.06(10)	0.44
$8_{4,4} - 9_{3,6}$	EE	$8_{4,4} - 9_{3,7}$	33 348.31(10)	0.28
$8_{4,5} - 9_{3,7}$	EA	$8_{4,5} - 9_{3,6}$	33 924.34(10)	0.39
	EE		33 932.36(10)	0.28
$8_{5,3} - 9_{4,5}$	EA	$8_{5,3} - 9_{4,6}$	92 699.03(15)	0.91
	EE		92 701.90(15)	0.80
$8_{5,4} - 9_{4,6}$	EA	$8_{5,4} - 9_{4,5}$	92 706.45(15)	0.91
	EE		92 710.29(15)	0.80

[a] See the spin weights and line strength for the connected allowed transition from which intensity is borrowed.

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
2734.75(6)		4(2, 2) - 5(1, 5)	AE	4	1.0
2734.88(6)		4(2, 2) - 5(1, 5)	EA	2	1.0
2737.28(3)		4(2, 2) - 5(1, 5)	EE	16	1.0
2739.75(3)		4(2, 2) - 5(1, 5)	AA	6	1.0
3231.85(4)		8(2, 7) - 7(3, 4)	AA	10	1.0
3235.00(6)		8(2, 7) - 7(3, 4)	EE	16	1.0
3237.78(12)		8(2, 7) - 7(3, 4)	EA	4	1.0
3238.52(15)		8(2, 7) - 7(3, 4)	AE	6	1.0
3546.70(7)		14(4,11) - 13(5, 8)	AA	10	1.0
3547.98(0)		14(4,11) - 13(5, 8)	EA	4	0.67
3548.11(1)		14(4,11) - 13(5, 8)	EE	16	0.81
3553.08(21)		14(4,11) - 13(5, 8)	AE	6	1.0
3982.67(8)		14(4,10) - 13(5, 9)	AA	6	1.0
3987.64(19)		14(4,10) - 13(5, 9)	EE	16	0.81
3989.05(22)		14(4,10) - 13(5, 9)	AE	4	1.0
3994.14(43)		14(4,10) - 13(5, 9)	EA	2	0.67
4316.14(4)		11(3, 9) - 10(4, 6)	AA	6	1.0
4318.97(6)		11(3, 9) - 10(4, 6)	EE	16	0.98
4320.50(8)		11(3, 9) - 10(4, 6)	EA	2	0.92
4323.36(21)		11(3, 9) - 10(4, 6)	AE	4	1.0
6240.86(5)		11(3, 8) - 10(4, 7)	AA	10	1.0
6245.25(14)		11(3, 8) - 10(4, 7)	EE	16	0.98
6248.11(22)		11(3, 8) - 10(4, 7)	AE	6	1.0
6250.97(34)		11(3, 8) - 10(4, 7)	EA	4	0.92
6418.62(12)		3(2, 2) - 4(1, 3)	EA	2	1.0
6419.02(11)		3(2, 2) - 4(1, 3)	AE	4	1.0
6421.21(5)		3(2, 2) - 4(1, 3)	EE	16	1.0
6423.60(3)		3(2, 2) - 4(1, 3)	AA	6	1.0
9118.90(1)	9118.818(30)	2(0, 2) - 1(1, 1)	AA	6	1.0
9119.74(1)	9119.670(15)	2(0, 2) - 1(1, 1)	EE	16	1.0
9120.56(3)	9120.517(15)	2(0, 2) - 1(1, 1)	AE	2	1.0
9120.58(3)	9120.517(15)	2(0, 2) - 1(1, 1)	EA	4	1.0
10336.00(4)		8(2, 6) - 7(3, 5)	AA	6	1.0
10339.49(10)		8(2, 6) - 7(3, 5)	EE	16	1.0
10342.63(19)		8(2, 6) - 7(3, 5)	AE	4	1.0
10343.37(22)		8(2, 6) - 7(3, 5)	EA	2	1.0
10616.17(22)		6(3, 4) - 7(2, 5)	EA	4	0.97
10618.02(16)		6(3, 4) - 7(2, 5)	AE	6	1.0
10620.94(9)		6(3, 4) - 7(2, 5)	EE	16	0.99
10624.80(4)		6(3, 4) - 7(2, 5)	AA	10	1.0
11817.40(4)		6(1, 6) - 5(2, 3)	AA	10	1.0
11819.90(3)		6(1, 6) - 5(2, 3)	EE	16	1.0
11822.38(6)		6(1, 6) - 5(2, 3)	EA	4	1.0
11822.43(6)		6(1, 6) - 5(2, 3)	AE	6	1.0
13686.20(37)		9(4, 6) - 10(3, 7)	EA	2	0.77
13691.63(19)		9(4, 6) - 10(3, 7)	AE	4	1.0
13693.63(16)		9(4, 6) - 10(3, 7)	EE	16	0.90
13699.04(4)		9(4, 6) - 10(3, 7)	AA	6	1.0
14799.67(19)		9(4, 5) - 10(3, 8)	AE	6	1.0
14805.08(2)		9(4, 5) - 10(3, 8)	EE	16	0.90
14805.11(4)		9(4, 5) - 10(3, 8)	EA	4	0.77
14807.08(4)		9(4, 5) - 10(3, 8)	AA	10	1.0
14938.14(14)		6(3, 3) - 7(2, 6)	AE	4	1.0
14939.99(8)		6(3, 3) - 7(2, 6)	EA	2	0.97
14942.01(5)		6(3, 3) - 7(2, 6)	EE	16	0.99
14944.94(3)		6(3, 3) - 7(2, 6)	AA	6	1.0
15307.58(3)		5(1, 4) - 4(2, 3)	AA	10	1.0
15309.81(6)		5(1, 4) - 4(2, 3)	EE	16	1.0
15311.99(12)		5(1, 4) - 4(2, 3)	AE	6	1.0
15312.12(13)		5(1, 4) - 4(2, 3)	EA	4	1.0
15567.97(45)		12(5, 8) - 13(4, 9)	EA	4	0.55
15574.69(21)		12(5, 8) - 13(4, 9)	AE	6	1.0
15575.26(21)		12(5, 8) - 13(4, 9)	EE	16	0.65
15581.38(8)		12(5, 8) - 13(4, 9)	AA	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
15818.28(20)		12(5, 7) – 13(4,10)	AE	4	1.0
15824.34(1)		12(5, 7) – 13(4,10)	EE	16	0.65
15824.90(7)		12(5, 7) – 13(4,10)	AA	6	1.0
15824.99(2)		12(5, 7) – 13(4,10)	EA	2	0.55
18284.77(7)		3(2, 1) – 4(1, 4)	AE	6	1.0
18285.17(6)		3(2, 1) – 4(1, 4)	EA	4	1.0
18287.36(3)		3(2, 1) – 4(1, 4)	EE	16	1.0
18289.75(3)		3(2, 1) – 4(1, 4)	AA	10	1.0
21035.97(4)		9(2, 8) – 8(3, 5)	AA	6	1.0
21039.15(7)		9(2, 8) – 8(3, 5)	EE	16	1.0
21042.15(14)		9(2, 8) – 8(3, 5)	EA	2	1.0
21042.49(15)		9(2, 8) – 8(3, 5)	AE	4	1.0
22975.29(7)		15(4,12) – 14(5, 9)	AA	6	1.0
22977.42(5)		15(4,12) – 14(5, 9)	EE	16	0.94
22978.23(5)		15(4,12) – 14(5, 9)	EA	2	0.85
22981.42(24)		15(4,12) – 14(5, 9)	AE	4	1.0
23389.92(4)		12(3,10) – 11(4, 7)	AA	10	1.0
23393.08(9)		12(3,10) – 11(4, 7)	EE	16	1.0
23395.56(16)		12(3,10) – 11(4, 7)	EA	4	1.0
23396.92(23)		12(3,10) – 11(4, 7)	AE	6	1.0
23723.11(8)		15(4,11) – 14(5,10)	AA	10	1.0
23727.14(18)		15(4,11) – 14(5,10)	EE	16	0.94
23729.30(26)		15(4,11) – 14(5,10)	AE	6	1.0
23732.52(44)		15(4,11) – 14(5,10)	EA	4	0.84
25211.21(5)		7(1, 7) – 6(2, 4)	AA	6	1.0
25213.74(3)		7(1, 7) – 6(2, 4)	EE	16	1.0
25216.25(7)		7(1, 7) – 6(2, 4)	EA	2	1.0
25216.28(7)		7(1, 7) – 6(2, 4)	AE	4	1.0
26564.68(5)	26564.80 (30)	12(3, 9) – 11(4, 8)	AA	6	1.0
26568.52(14)	26568.544(50)	12(3, 9) – 11(4, 8)	EE	16	1.0
26571.71(25)	26571.66 (8)	12(3, 9) – 11(4, 8)	AE	2	1.0
26573.07(31)	26572.82 (8)	12(3, 9) – 11(4, 8)	EA	4	1.0
27625.59(14)	27625.76 (5)	2(2, 1) – 3(1, 2)	EA	4	0.95
27627.49(9)	27627.56 (5)	2(2, 1) – 3(1, 2)	AE	6	1.0
27629.36(6)	27629.432(30)	2(2, 1) – 3(1, 2)	EE	16	0.99
27632.22(3)	27632.296(30)	2(2, 1) – 3(1, 2)	AA	10	1.0
29091.39(2)	29091.33 (5)	3(0, 3) – 2(1, 2)	AA	10	1.0
29092.18(2)	29092.12 (5)	3(0, 3) – 2(1, 2)	EE	16	1.0
29092.97(4)	29092.92 (5)	3(0, 3) – 2(1, 2)	EA	4	1.0
29092.97(4)	29092.92 (5)	3(0, 3) – 2(1, 2)	AE	6	1.0
29900.48(2)	29900.480(30)	1(1, 0) – 1(0, 1)	AE	6	1.0
29900.50(2)	29900.480(30)	1(1, 0) – 1(0, 1)	EA	4	1.0
29901.37(1)	29901.400(30)	1(1, 0) – 1(0, 1)	EE	16	1.0
29902.26(1)	29902.288(30)	1(1, 0) – 1(0, 1)	AA	10	1.0
30966.21(26)	30966.568(50)	5(3, 3) – 6(2, 4)	EA	4	0.83
30970.90(14)	30971.000(50)	5(3, 3) – 6(2, 4)	AE	2	1.0
30972.99(11)	30973.168(30)	5(3, 3) – 6(2, 4)	EE	16	0.94
30977.81(4)	30977.816(30)	5(3, 3) – 6(2, 4)	AA	6	1.0
31105.23(2)	31105.26 (10)	2(1, 1) – 2(0, 2)	AE	2	1.0
31105.23(2)	31105.26 (10)	2(1, 1) – 2(0, 2)	EA	4	1.0
31106.13(1)	31106.20 (5)	2(1, 1) – 2(0, 2)	EE	16	1.0
31107.04(1)	31107.12 (10)	2(1, 1) – 2(0, 2)	AA	6	1.0
31996.14(5)	31996.104(30)	9(2, 7) – 8(3, 6)	AA	10	1.0
31999.44(11)	31999.328(30)	9(2, 7) – 8(3, 6)	EE	16	1.0
32002.58(22)	32002.464(30)	9(2, 7) – 8(3, 6)	AE	6	1.0
32002.91(23)	32002.702(50)	9(2, 7) – 8(3, 6)	EA	4	1.0
32977.29(3)	32977.34 (14)	3(1, 2) – 3(0, 3)	AE	6	1.0
32977.29(3)	32977.34 (14)	3(1, 2) – 3(0, 3)	EA	4	1.0
32978.22(1)	32978.29 (5)	3(1, 2) – 3(0, 3)	EE	16	1.0
32979.15(1)	32979.24 (10)	3(1, 2) – 3(0, 3)	AA	10	1.0
33328.63(37)		8(4, 5) – 9(3, 6)	EA	4	0.60
33336.71(17)		8(4, 5) – 9(3, 6)	AE	6	1.0
33337.32(17)		8(4, 5) – 9(3, 6)	EE	16	0.71
33344.30(4)		8(4, 5) – 9(3, 6)	AA	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
33392.70(13)	33392.76 (5)	5(3, 2) - 6(2, 5)	AE	6	1.0
33397.38(4)	33397.15 (5)	5(3, 2) - 6(2, 5)	EA	4	0.83
33397.53(2)	33397.49 (5)	5(3, 2) - 6(2, 5)	EE	16	0.94
33399.62(3)	33399.68 (5)	5(3, 2) - 6(2, 5)	AA	10	1.0
33936.41(17)		8(4, 4) - 9(3, 7)	AE	4	1.0
33943.38(1)		8(4, 4) - 9(3, 7)	EE	16	0.71
33944.00(4)		8(4, 4) - 9(3, 7)	AA	6	1.0
33944.47(4)		8(4, 4) - 9(3, 7)	EA	2	0.60
34679.53(7)	34679.60 (5)	2(2, 0) - 3(1, 3)	AE	2	1.0
34681.43(2)	34681.45 (5)	2(2, 0) - 3(1, 3)	EA	4	1.0
34682.50(2)	34682.59 (5)	2(2, 0) - 3(1, 3)	EE	16	1.0
34684.49(3)	34684.63 (5)	2(2, 0) - 3(1, 3)	AA	6	1.0
34991.11(41)		11(5, 7) - 12(4, 8)	EA	2	0.61
34998.92(19)		11(5, 7) - 12(4, 8)	EE	16	0.61
34999.08(18)		11(5, 7) - 12(4, 8)	AE	4	1.0
35005.92(8)		11(5, 7) - 12(4, 8)	AA	6	1.0
35128.54(18)		11(5, 6) - 12(4, 9)	AE	6	1.0
35135.38(8)		11(5, 6) - 12(4, 9)	AA	10	1.0
35135.54(1)		11(5, 6) - 12(4, 9)	EE	16	0.61
35136.50(4)		11(5, 6) - 12(4, 9)	EA	4	0.61
35592.45(3)	35592.40 (10)	4(1, 3) - 4(0, 4)	AE	2	1.0
35592.45(3)	35592.40 (10)	4(1, 3) - 4(0, 4)	EA	4	1.0
35593.42(1)	35593.409(50)	4(1, 3) - 4(0, 4)	EE	16	1.0
35594.38(2)	35594.39 (10)	4(1, 3) - 4(0, 4)	AA	6	1.0
36446.88(40)		14(6, 9) - 15(5,10)	EA	4	0.28
36452.72(17)		14(6, 9) - 15(5,10)	EE	16	0.40
36452.79(13)		14(6, 9) - 15(5,10)	AE	6	1.0
36457.66(17)		14(6, 9) - 15(5,10)	AA	10	1.0
36478.77(13)		14(6, 8) - 15(5,11)	AE	4	1.0
36483.64(17)		14(6, 8) - 15(5,11)	AA	6	1.0
36483.70(4)		14(6, 8) - 15(5,11)	EE	16	0.42
36484.67(13)		14(6, 8) - 15(5,11)	EA	2	0.28
37261.28(6)	37261.21 (5)	8(1, 8) - 7(2, 5)	AA	10	1.0
37263.85(4)	37263.86 (3)	8(1, 8) - 7(2, 5)	EE	16	1.0
37266.40(9)	37266.50 (5)	8(1, 8) - 7(2, 5)	EA	4	1.0
37266.42(9)	37266.50 (5)	8(1, 8) - 7(2, 5)	AE	6	1.0
37533.83(4)	37533.69 (3)	6(1, 5) - 5(2, 4)	AA	6	1.0
37535.94(7)	37535.80 (3)	6(1, 5) - 5(2, 4)	EE	16	1.0
37538.03(14)	37537.92 (3)	6(1, 5) - 5(2, 4)	AE	2	1.0
37538.09(14)	37537.92 (3)	6(1, 5) - 5(2, 4)	EA	4	1.0
38354.45(4)	38354.45 (4)	10(2, 9) - 9(3, 6)	AA	10	1.0
38357.59(8)	38357.58 (4)	10(2, 9) - 9(3, 6)	EE	16	1.0
38360.67(16)	38360.70 (5)	10(2, 9) - 9(3, 6)	EA	4	1.0
38360.83(17)	38360.70 (5)	10(2, 9) - 9(3, 6)	AE	6	1.0
39046.31(5)	39046.26 (3)	5(1, 4) - 5(0, 5)	AE	6	1.0
39046.31(5)	39046.26 (3)	5(1, 4) - 5(0, 5)	EA	4	1.0
39047.32(2)	39047.26 (3)	5(1, 4) - 5(0, 5)	EE	16	1.0
39048.33(2)	39048.33 (3)	5(1, 4) - 5(0, 5)	AA	10	1.0
42365.54(4)		13(3,11) - 12(4, 8)	AA	6	1.0
42368.73(11)		13(3,11) - 12(4, 8)	EE	16	1.0
42371.60(20)		13(3,11) - 12(4, 8)	EA	2	1.0
42372.26(24)		13(3,11) - 12(4, 8)	AE	4	1.0
43446.54(7)		6(1, 5) - 6(0, 6)	EA	2	1.0
43446.54(7)		6(1, 5) - 6(0, 6)	AE	4	1.0
43447.61(3)		6(1, 5) - 6(0, 6)	EE	16	1.0
43448.67(3)		6(1, 5) - 6(0, 6)	AA	6	1.0
47374.42(6)		13(3,10) - 12(4, 9)	AA	10	1.0
47377.97(14)		13(3,10) - 12(4, 9)	EE	16	1.0
47381.20(27)		13(3,10) - 12(4, 9)	AE	6	1.0
47381.84(31)		13(3,10) - 12(4, 9)	EA	4	1.0
47674.05(2)		1(1, 1) - 0(0, 0)	EA	2	1.0
47674.07(2)		1(1, 1) - 0(0, 0)	AE	4	1.0
47674.95(1)		1(1, 1) - 0(0, 0)	EE	16	1.0
47675.85(2)		1(1, 1) - 0(0, 0)	AA	6	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
47793.64(7)		9(1, 9) - 8(2, 6)	AA	6	1.0
47796.26(6)		9(1, 9) - 8(2, 6)	EE	16	1.0
47798.86(12)		9(1, 9) - 8(2, 6)	EA	2	1.0
47798.87(12)		9(1, 9) - 8(2, 6)	AE	4	1.0
48900.39(9)		7(1, 6) - 7(0, 7)	AE	6	1.0
48900.39(9)		7(1, 6) - 7(0, 7)	EA	4	1.0
48901.52(4)		7(1, 6) - 7(0, 7)	EE	16	1.0
48902.64(4)		7(1, 6) - 7(0, 7)	AA	10	1.0
49461.23(3)		4(0, 4) - 3(1, 3)	AA	6	1.0
49461.97(2)		4(0, 4) - 3(1, 3)	EE	16	1.0
49462.70(5)		4(0, 4) - 3(1, 3)	EA	2	1.0
49462.70(5)		4(0, 4) - 3(1, 3)	AE	4	1.0
50820.87(28)		4(3, 2) - 5(2, 3)	EA	4	0.61
50829.34(13)		4(3, 2) - 5(2, 3)	AE	6	1.0
50829.42(13)		4(3, 2) - 5(2, 3)	EE	16	0.71
50836.36(4)		4(3, 2) - 5(2, 3)	AA	10	1.0
52046.89(12)		4(3, 1) - 5(2, 4)	AE	4	1.0
52053.83(2)		4(3, 1) - 5(2, 4)	EE	16	0.70
52053.92(3)		4(3, 1) - 5(2, 4)	AA	6	1.0
52055.36(6)		4(3, 1) - 5(2, 4)	EA	2	0.60
52751.77(35)		7(4, 4) - 8(3, 5)	EA	2	0.57
52761.03(17)		7(4, 4) - 8(3, 5)	EE	16	0.60
52761.60(16)		7(4, 4) - 8(3, 5)	AE	4	1.0
52769.37(4)		7(4, 4) - 8(3, 5)	AA	6	1.0
53062.49(16)		7(4, 3) - 8(3, 6)	AE	6	1.0
53070.24(4)		7(4, 3) - 8(3, 6)	AA	10	1.0
53070.83(2)		7(4, 3) - 8(3, 6)	EE	16	0.60
53072.33(5)		7(4, 3) - 8(3, 6)	EA	4	0.57
54303.76(39)		10(5, 6) - 11(4, 7)	EA	4	0.37
54312.29(18)		10(5, 6) - 11(4, 7)	EE	16	0.46
54312.99(15)		10(5, 6) - 11(4, 7)	AE	6	1.0
54319.96(8)		10(5, 6) - 11(4, 7)	AA	10	1.0
54377.92(15)		10(5, 5) - 11(4, 8)	AE	4	1.0
54384.89(8)		10(5, 5) - 11(4, 8)	AA	6	1.0
54385.58(2)		10(5, 5) - 11(4, 8)	EE	16	0.46
54387.14(8)		10(5, 5) - 11(4, 8)	EA	2	0.37
54413.71(6)	54413.72 (6)	10(2, 8) - 9(3, 7)	AA	6	1.0
54416.85(13)	54416.80 (5)	10(2, 8) - 9(3, 7)	EE	16	1.0
54419.93(26)	54419.95 (6)	10(2, 8) - 9(3, 7)	AE	2	1.0
54420.07(26)	54419.95 (6)	10(2, 8) - 9(3, 7)	EA	4	1.0
55054.85(5)	55054.84 (5)	11(2,10) - 10(3, 7)	AA	6	1.0
55057.91(8)	55057.93 (4)	11(2,10) - 10(3, 7)	EE	16	1.0
55060.94(16)	55060.97 (5)	11(2,10) - 10(3, 7)	EA	4	1.0
55061.04(17)	55060.97 (5)	11(2,10) - 10(3, 7)	AE	2	1.0
55498.15(11)	55497.95 (5)	8(1, 7) - 8(0, 8)	AE	2	1.0
55498.15(11)	55497.95 (5)	8(1, 7) - 8(0, 8)	EA	4	1.0
55499.36(5)	55499.18 (5)	8(1, 7) - 8(0, 8)	EE	16	1.0
55500.56(5)	55500.52 (8)	8(1, 7) - 8(0, 8)	AA	6	1.0
55735.42(42)		13(6, 8) - 14(5, 9)	EA	2	0.14
55742.46(17)		13(6, 8) - 14(5, 9)	EE	16	0.27
55743.02(10)		13(6, 8) - 14(5, 9)	AE	4	1.0
55748.08(17)		13(6, 8) - 14(5, 9)	AA	6	1.0
55756.06(10)		13(6, 7) - 14(5,10)	AE	6	1.0
55761.12(17)		13(6, 7) - 14(5,10)	AA	10	1.0
55761.68(6)		13(6, 7) - 14(5,10)	EE	16	0.27
55763.65(20)		13(6, 7) - 14(5,10)	EA	4	0.14
56658.34(9)	56658.35 (5)	10(1,10) - 9(2, 7)	AA	10	1.0
56661.02(7)	56661.20 (5)	10(1,10) - 9(2, 7)	EE	16	1.0
56663.69(15)	56663.90 (5)	10(1,10) - 9(2, 7)	EA	4	1.0
56663.70(15)	56663.90 (5)	10(1,10) - 9(2, 7)	AE	6	1.0
60219.66(5)		7(1, 6) - 6(2, 5)	AA	10	1.0
60221.66(8)		7(1, 6) - 6(2, 5)	EE	16	1.0
60223.64(16)		7(1, 6) - 6(2, 5)	AE	6	1.0
60223.67(16)		7(1, 6) - 6(2, 5)	EA	4	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
61179.77(5)		14(3,12) - 13(4, 9)	AA	10	1.0
61182.86(11)		14(3,12) - 13(4, 9)	EE	16	1.0
61185.83(22)		14(3,12) - 13(4, 9)	EA	4	1.0
61186.15(23)		14(3,12) - 13(4, 9)	AE	6	1.0
63295.46(15)		9(1, 8) - 9(0, 9)	AE	6	1.0
63295.46(15)		9(1, 8) - 9(0, 9)	EA	4	1.0
63296.77(7)		9(1, 8) - 9(0, 9)	EE	16	1.0
63298.07(6)		9(1, 8) - 9(0, 9)	AA	10	1.0
63744.09(10)		11(1,11) - 10(2, 8)	AA	6	1.0
63746.86(9)		11(1,11) - 10(2, 8)	EE	16	1.0
63749.62(19)		11(1,11) - 10(2, 8)	EA	2	1.0
63749.62(19)		11(1,11) - 10(2, 8)	AE	4	1.0
65447.60(2)	65447.62 (5)	2(1, 2) - 1(0, 1)	AE	6	1.0
65447.60(2)	65447.62 (5)	2(1, 2) - 1(0, 1)	EA	4	1.0
65448.49(1)	65448.50 (5)	2(1, 2) - 1(0, 1)	EE	16	1.0
65449.38(3)	65449.40 (5)	2(1, 2) - 1(0, 1)	AA	10	1.0
68779.63(7)		14(3,11) - 13(4,10)	AA	6	1.0
68782.97(16)		14(3,11) - 13(4,10)	EE	16	1.0
68786.19(32)		14(3,11) - 13(4,10)	AE	4	1.0
68786.54(34)		14(3,11) - 13(4,10)	EA	2	1.0
68986.51(10)		12(1,12) - 11(2, 9)	AA	10	1.0
68989.38(12)		12(1,12) - 11(2, 9)	EE	16	1.0
68992.26(24)		12(1,12) - 11(2, 9)	EA	4	1.0
68992.26(24)		12(1,12) - 11(2, 9)	AE	6	1.0
70118.93(3)		5(0, 5) - 4(1, 4)	AA	10	1.0
70119.60(2)		5(0, 5) - 4(1, 4)	EE	16	1.0
70120.27(5)		5(0, 5) - 4(1, 4)	EA	4	1.0
70120.27(5)		5(0, 5) - 4(1, 4)	AE	6	1.0
70303.56(26)		3(3, 1) - 4(2, 2)	EA	2	0.50
70312.48(13)		3(3, 1) - 4(2, 2)	EE	16	0.52
70313.91(12)		3(3, 1) - 4(2, 2)	AE	4	1.0
70321.03(4)		3(3, 1) - 4(2, 2)	AA	6	1.0
70837.30(12)		3(3, 0) - 4(2, 3)	AE	6	1.0
70844.42(4)		3(3, 0) - 4(2, 3)	AA	10	1.0
70845.85(3)		3(3, 0) - 4(2, 3)	EE	16	0.52
70847.66(7)		3(3, 0) - 4(2, 3)	EA	4	0.50
70984.80(7)	70984.90 (10)	12(2,11) - 11(3, 8)	AA	10	1.0
70987.78(8)	70987.89 (10)	12(2,11) - 11(3, 8)	EE	16	1.0
70990.75(16)	70990.85 (10)	12(2,11) - 11(3, 8)	EA	4	1.0
70990.80(17)	70990.85 (10)	12(2,11) - 11(3, 8)	AE	6	1.0
72015.12(33)		6(4, 3) - 7(3, 4)	EA	4	0.58
72024.85(16)	72025.15 (10)	6(4, 3) - 7(3, 4)	EE	16	0.56
72026.10(14)	72026.21 (10)	6(4, 3) - 7(3, 4)	AE	6	1.0
72033.99(4)	72033.95 (10)	6(4, 3) - 7(3, 4)	AA	10	1.0
72163.16(14)	72163.23 (10)	6(4, 2) - 7(3, 5)	AE	2	1.0
72171.05(4)	72171.00 (10)	6(4, 2) - 7(3, 5)	AA	6	1.0
72172.30(2)	72172.00 (10)	6(4, 2) - 7(3, 5)	EE	16	0.56
72174.14(5)	72173.57 (10)	6(4, 2) - 7(3, 5)	EA	4	0.58
72298.70(18)		10(1, 9) - 10(0,10)	AE	4	1.0
72298.70(18)		10(1, 9) - 10(0,10)	EA	2	1.0
72300.12(9)		10(1, 9) - 10(0,10)	EE	16	1.0
72301.53(7)		10(1, 9) - 10(0,10)	AA	6	1.0
72368.87(10)		13(1,13) - 12(2,10)	AA	6	1.0
72371.87(14)		13(1.13) - 12(2,10)	EE	16	1.0
72374.87(29)		13(1,13) - 12(2,10)	AE	4	1.0
72374.87(29)		13(1,13) - 12(2,10)	EA	2	1.0
73466.93(10)		10(2, 8) - 10(1, 9)	EA	2	1.0
73466.93(10)		10(2, 8) - 10(1, 9)	AE	4	1.0
73468.71(5)		10(2, 8) - 10(1, 9)	EE	16	1.0
73470.49(5)		10(2, 8) - 10(1, 9)	AA	6	1.0
73528.09(42)		9(5, 5) - 10(4, 6)	EA	4	0.24
73537.89(19)	73538.62 (20)	9(5, 5) - 10(4, 6)	EE	16	0.36
73539.15(14)		9(5, 5) - 10(4, 6)	AE	2	1.0
73546.31(8)	73546.28 (5)	9(5, 5) - 10(4, 6)	AA	6	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
73569.51(14)		9(5, 4) - 10(4, 7)	AE	6	1.0
73576.67(8)		9(5, 4) - 10(4, 7)	AA	10	1.0
73577.94(4)		9(5, 4) - 10(4, 7)	EE	16	0.36
73580.58(13)		9(5, 4) - 10(4, 7)	EA	4	0.24
73694.44(10)		15(1,15) - 14(2,12)	AA	6	1.0
73697.78(19)		15(1,15) - 14(2,12)	EE	16	1.0
73701.13(38)		15(1,15) - 14(2,12)	AE	4	1.0
73701.13(38)		15(1,15) - 14(2,12)	EA	2	1.0
73720.51(11)		9(2, 7) - 9(1, 8)	AE	6	1.0
73720.52(11)		9(2, 7) - 9(1, 8)	EA	4	1.0
73722.40(5)		9(2, 7) - 9(1, 8)	EE	16	1.0
73724.28(4)		9(2, 7) - 9(1, 8)	AA	10	1.0
73917.46(10)		14(1,14) - 13(2,11)	AA	10	1.0
73920.62(17)		14(1,14) - 13(2,11)	EE	16	1.0
73923.77(34)		14(1,14) - 13(2,11)	AE	6	1.0
73923.77(34)		14(1,14) - 13(2,11)	EA	4	1.0
74149.26(9)		11(2, 9) - 11(1,10)	EA	4	1.0
74149.26(9)		11(2, 9) - 11(1,10)	AE	6	1.0
74150.95(4)		11(2, 9) - 11(1,10)	EE	16	1.0
74152.64(5)		11(2, 9) - 11(1,10)	AA	10	1.0
74747.51(12)		8(2, 6) - 8(1, 7)	AE	4	1.0
74747.52(12)		8(2, 6) - 8(1, 7)	EA	2	1.0
74749.50(6)		8(2, 6) - 8(1, 7)	EE	16	1.0
74751.49(4)		8(2, 6) - 8(1, 7)	AA	6	1.0
74961.03(44)		12(6, 7) - 13(5, 8)	EA	4	0.04
74969.18(19)		12(6, 7) - 13(5, 8)	EE	16	0.12
74970.62(11)		12(6, 7) - 13(5, 8)	AE	6	1.0
74975.87(17)		12(6, 7) - 13(5, 8)	AA	10	1.0
74976.82(11)		12(6, 6) - 13(5, 9)	AE	4	1.0
74982.07(17)		12(6, 6) - 13(5, 9)	AA	6	1.0
74983.54(8)		12(6, 6) - 13(5, 9)	EE	16	0.12
74986.45(21)		12(6, 6) - 13(5, 9)	EA	2	0.04
75906.42(7)		12(2,10) - 12(1,11)	AE	4	1.0
75906.42(7)		12(2,10) - 12(1,11)	EA	2	1.0
75908.03(3)		12(2,10) - 12(1,11)	EE	16	1.0
75909.64(5)		12(2,10) - 12(1,11)	AA	6	1.0
76362.16(12)		7(2, 5) - 7(1, 6)	AE	6	1.0
76362.18(12)		7(2, 5) - 7(1, 6)	EA	4	1.0
76364.26(6)		7(2, 5) - 7(1, 6)	EE	16	1.0
76366.35(4)		7(2, 5) - 7(1, 6)	AA	10	1.0
77607.68(7)		11(2, 9) - 10(3, 8)	AA	10	1.0
77610.65(13)		11(2, 9) - 10(3, 8)	EE	16	1.0
77613.59(27)		11(2, 9) - 10(3, 8)	AE	6	1.0
77613.66(28)		11(2, 9) - 10(3, 8)	EA	4	1.0
78361.40(11)		6(2, 4) - 6(1, 5)	AE	4	1.0
78361.43(11)		6(2, 4) - 6(1, 5)	EA	2	1.0
78363.59(5)		6(2, 4) - 6(1, 5)	EE	16	1.0
78365.77(4)		6(2, 4) - 6(1, 5)	AA	6	1.0
78856.40(4)		13(2,11) - 13(1,12)	AE	6	1.0
78856.40(4)		13(2,11) - 13(1,12)	EA	4	1.0
78857.91(2)		13(2,11) - 13(1,12)	EE	16	1.0
78859.43(6)		13(2,11) - 13(1,12)	AA	10	1.0
79753.49(7)		15(3,13) - 14(4,10)	AA	6	1.0
79756.55(13)		15(3,13) - 14(4,10)	EE	16	1.0
79759.52(27)		15(3,13) - 14(4,10)	EA	2	1.0
79759.68(27)		15(3,13) - 14(4,10)	AE	4	1.0
80536.33(10)	80536.24 (10)	5(2, 3) - 5(1, 4)	AE	6	1.0
80536.39(10)	80536.24 (10)	5(2, 3) - 5(1, 4)	EA	4	1.0
80538.62(5)	80538.54 (10)	5(2, 3) - 5(1, 4)	EE	16	1.0
80540.87(4)	80540.88 (10)	5(2, 3) - 5(1, 4)	AA	10	1.0
82457.25(22)	82456.96 (10)	11(1,10) - 11(0,11)	AE	6	1.0
82457.25(22)	82456.96 (10)	11(1,10) - 11(0,11)	EA	4	1.0
82458.82(11)	82458.62 (10)	11(1,10) - 11(0,11)	EE	16	1.0
82460.38(8)	82460.36 (10)	11(1,10) - 11(0,11)	AA	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
82649.47(3)	82649.30 (10)	3(1, 3) - 2(0, 2)	*AE*	2	1.0
82649.47(3)	82649.30 (10)	3(1, 3) - 2(0, 2)	*EA*	4	1.0
82650.35(1)	82650.18 (10)	3(1, 3) - 2(0, 2)	*EE*	16	1.0
82651.22(4)	82651.08 (10)	3(1, 3) - 2(0, 2)	*AA*	6	1.0
82686.34(10)	82686.50 (10)	4(2, 2) - 4(1, 3)	*AE*	2	1.0
82686.47(9)	82686.50 (10)	4(2, 2) - 4(1, 3)	*EA*	4	1.0
82688.72(4)	82688.77 (10)	4(2, 2) - 4(1, 3)	*EE*	16	1.0
82691.03(4)	82691.14 (10)	4(2, 2) - 4(1, 3)	*AA*	6	1.0
83097.53(4)	83097.38 (10)	14(2,12) - 14(1,13)	*AE*	2	1.0
83097.53(4)	83097.38 (10)	14(2,12) - 14(1,13)	*EA*	4	1.0
83099.00(2)	83098.92 (10)	14(2,12) - 14(1,13)	*EE*	16	1.0
83100.47(7)	83100.44 (10)	14(2,12) - 14(1,13)	*AA*	6	1.0
83319.56(5)	83319.43 (10)	8(1, 7) - 7(2, 6)	*AA*	6	1.0
83321.43(9)	83321.24 (10)	8(1, 7) - 7(2, 6)	*EE*	16	1.0
83323.29(18)	83323.06 (10)	8(1, 7) - 7(2, 6)	*AE*	2	1.0
83323.30(18)	83323.06 (10)	8(1, 7) - 7(2, 6)	*EA*	4	1.0
84631.89(9)	84632.02 (10)	3(2, 1) - 3(1, 2)	*AE*	6	1.0
84632.28(7)	84632.02 (10)	3(2, 1) - 3(1, 2)	*EA*	4	1.0
84634.39(4)	84634.40 (10)	3(2, 1) - 3(1, 2)	*EE*	16	1.0
84636.69(4)	84636.80 (10)	3(2, 1) - 3(1, 2)	*AA*	10	1.0
85973.13(9)	85973.216(100)	13(2,12) - 12(3, 9)	*AA*	6	1.0
85976.04(8)	85976.096(100)	13(2,12) - 12(3, 9)	*EE*	16	1.0
85978.91(16)	85978.94 (10)	13(2,12) - 12(3, 9)	*EA*	4	1.0
85978.94(16)	85978.94 (10)	13(2,12) - 12(3, 9)	*AE*	2	1.0
86223.77(8)	86223.76 (10)	2(2, 0) - 2(1, 1)	*AE*	2	1.0
86225.67(3)	86225.67 (12)	2(2, 0) - 2(1, 1)	*EA*	4	0.95
86226.72(2)	86226.73 (10)	2(2, 0) - 2(1, 1)	*EE*	16	0.99
86228.67(4)	86228.72 (12)	2(2, 0) - 2(1, 1)	*AA*	6	1.0
88706.38(8)	88706.216(100)	15(2,13) - 15(1,14)	*EA*	4	1.0
88706.38(8)	88706.216(100)	15(2,13) - 15(1,14)	*AE*	6	1.0
88707.78(4)	88707.644(100)	15(2,13) - 15(1,14)	*EE*	16	1.0
88709.19(8)	88709.072(100)	15(2,13) - 15(1,14)	*AA*	10	1.0
89695.85(11)	89695.88 (9)	2(2, 1) - 2(1, 2)	*EA*	4	0.95
89697.74(7)	89697.71 (9)	2(2, 1) - 2(1, 2)	*AE*	6	1.0
89699.76(4)	89699.81 (9)	2(2, 1) - 2(1, 2)	*EE*	16	0.99
89702.76(4)	89702.81 (9)	2(2, 1) - 2(1, 2)	*AA*	10	1.0
90888.97(8)	90889.20 (23)	15(3,12) - 14(4,11)	*AA*	10	1.0
90892.13(18)	90892.26 (23)	15(3,12) - 14(4,11)	*EE*	16	1.0
90895.22(35)	90895.32 (23)	15(3,12) - 14(4,11)	*AE*	6	1.0
90895.41(36)	90895.32 (23)	15(3,12) - 14(4,11)	*EA*	4	1.0
90937.64(4)	90937.539(40)	6(0, 6) - 5(1, 5)	*AA*	6	1.0
90938.24(3)	90938.099(30)	6(0, 6) - 5(1, 5)	*EE*	16	1.0
90938.84(6)	90938.674(50)	6(0, 6) - 5(1, 5)	*EA*	4	1.0
90938.84(6)	90938.674(50)	6(0, 6) - 5(1, 5)	*AE*	2	1.0
91164.22(33)		5(4, 2) - 6(3, 3)	*EA*	4	0.33
91174.89(15)	91175.25 (10)	5(4, 2) - 6(3, 3)	*EE*	16	0.41
91176.62(13)	91176.73 (10)	5(4, 2) - 6(3, 3)	*AE*	2	1.0
91184.62(5)	91184.48 (10)	5(4, 2) - 6(3, 3)	*AA*	6	1.0
91231.51(13)	91231.59 (10)	5(4, 1) - 6(3, 4)	*AE*	6	1.0
91239.51(5)	91239.39 (10)	5(4, 1) - 6(3, 4)	*AA*	10	1.0
91241.24(3)	91240.92 (10)	5(4, 1) - 6(3, 4)	*EE*	16	0.41
91243.92(8)	91243.29 (10)	5(4, 1) - 6(3, 4)	*EA*	4	0.33
91473.78(7)	91473.82 (23)	3(2, 2) - 3(1, 3)	*EA*	4	1.0
91474.17(6)	91473.82 (23)	3(2, 2) - 3(1, 3)	*AE*	2	1.0
91476.59(3)	91476.53 (18)	3(2, 2) - 3(1, 3)	*EE*	16	1.0
91479.21(4)	91479.31 (23)	3(2, 2) - 3(1, 3)	*AA*	6	1.0
92681.86(45)		8(5, 4) - 9(4, 5)	*EA*	4	0.08
92693.42(20)		8(5, 4) - 9(4, 5)	*EE*	16	0.20
92695.67(13)		8(5, 4) - 9(4, 5)	*AE*	6	1.0
92702.98(8)	92703.034(50)	8(5, 4) - 9(4, 5)	*AA*	10	1.0
92708.70(13)		8(5, 3) - 9(4, 6)	*AE*	2	1.0
92716.01(8)	92716.086(50)	8(5, 3) - 9(4, 6)	*AA*	6	1.0
92718.26(7)	92717.958(50)	8(5, 3) - 9(4, 6)	*EE*	16	0.20
92722.51(18)		8(5, 3) - 9(4, 6)	*EA*	4	0.08

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
93664.94(26)	93664.71 (10)	12(1,11) - 12(0,12)	*EA*	2	1.0
93664.94(26)	93664.71 (10)	12(1,11) - 12(0,12)	*AE*	2	1.0
93666.65(12)		12(1,11) - 12(0,12)	*EE*	16	1.0
93668.35(9)	93668.45 (20)	12(1,11) - 12(0,12)	*AA*	6	1.0
93854.47(7)	93854.44 (10)	4(2, 3) - 4(1, 4)	*EA*	4	1.0
93854.60(6)	93854.44 (10)	4(2, 3) - 4(1, 4)	*AE*	6	1.0
93857.11(3)	93857.11 (10)	4(2, 3) - 4(1, 4)	*EE*	16	1.0
93859.68(4)	93859.64 (10)	4(2, 3) - 4(1, 4)	*AA*	10	1.0
94133.47(39)		11(6, 6) - 12(5, 7)	*EA*	2	0.99
94142.28(18)		11(6, 6) - 12(5, 7)	*EE*	16	0.97
94144.72(7)		11(6, 6) - 12(5, 7)	*AE*	4	1.0
94147.48(7)		11(6, 5) - 12(5, 8)	*AE*	6	1.0
94150.03(18)		11(6, 6) - 12(5, 7)	*AA*	6	1.0
94152.79(18)		11(6, 5) - 12(5, 8)	*AA*	10	1.0
94155.23(10)		11(6, 5) - 12(5, 8)	*EE*	16	0.97
94158.73(24)		11(6, 5) - 12(5, 8)	*EA*	4	0.99
95544.69(19)		14(7, 8) - 15(6, 9)	*EA*	4	1.0
95548.44(10)		14(7, 8) - 15(6, 9)	*EE*	16	1.0
95549.19(5)		14(7, 8) - 15(6, 9)	*AE*	6	1.0
95549.74(5)		14(7, 7) - 15(6,10)	*AE*	4	1.0
95551.94(33)		14(7, 8) - 15(6, 9)	*AA*	10	1.0
95552.49(33)		14(7, 7) - 15(6,10)	*AA*	6	1.0
95553.24(6)		14(7, 7) - 15(6,10)	*EE*	16	0.97
95554.24(13)		14(7, 7) - 15(6,10)	*EA*	2	1.0
96847.30(7)	96847.25 (10)	5(2, 4) - 5(1, 5)	*EA*	4	1.0
96847.36(6)	96847.25 (10)	5(2, 4) - 5(1, 5)	*AE*	2	1.0
96849.91(3)	96849.85 (10)	5(2, 4) - 5(1, 5)	*EE*	16	1.0
96852.48(4)	96852.46 (10)	5(2, 4) - 5(1, 5)	*AA*	6	1.0
99324.40(3)	99324.43 (20)	4(1, 4) - 3(0, 3)	*AE*	6	1.0
99324.40(3)	99324.43 (20)	4(1, 4) - 3(0, 3)	*EA*	4	1.0
99325.24(1)	99325.25 (20)	4(1, 4) - 3(0, 3)	*EE*	16	1.0
99326.09(5)	99326.00 (20)	4(1, 4) - 3(0, 3)	*AA*	10	1.0
99833.50(12)		14(2,13) - 13(3,10)	*AA*	10	1.0
99836.30(7)		14(2,13) - 13(3,10)	*EE*	16	1.0
99839.08(14)		14(2,13) - 13(3,10)	*EA*	4	1.0
99839.09(14)		14(2,13) - 13(3,10)	*AE*	6	1.0
100460.51(7)	100460.52 (10)	6(2, 5) - 6(1, 6)	*EA*	4	1.0
100460.53(7)	100460.52 (10)	6(2, 5) - 6(1, 6)	*AE*	6	1.0
100463.11(3)	100463.04 (10)	6(2, 5) - 6(1, 6)	*EE*	16	1.0
100465.71(4)	100465.70 (10)	6(2, 5) - 6(1, 6)	*AA*	10	1.0
101559.30(7)	101559.35 (10)	12(2,10) - 11(3, 9)	*AA*	6	1.0
101562.13(16)	101562.17 (10)	12(2,10) - 11(3, 9)	*EE*	16	1.0
101564.92(31)	101564.90 (10)	12(2,10) - 11(3, 9)	*AE*	2	1.0
101564.96(31)	101564.90 (10)	12(2,10) - 11(3, 9)	*EA*	4	1.0
104700.69(8)	104700.62 (10)	7(2, 6) - 7(1, 7)	*EA*	4	1.0
104700.70(8)	104700.62 (10)	7(2, 6) - 7(1, 7)	*AE*	2	1.0
104703.33(4)	104703.30 (10)	7(2, 6) - 7(1, 7)	*EE*	16	1.0
104705.95(5)	104705.93 (10)	7(2, 6) - 7(1, 7)	*AA*	6	1.0
105768.60(29)		13(1,12) - 13(0,13)	*EA*	4	1.0
105768.60(29)		13(1,12) - 13(0,13)	*AE*	6	1.0
105770.50(14)		13(1,12) - 13(0,13)	*EE*	16	1.0
105772.41(12)		13(1,12) - 13(0,13)	*AA*	10	1.0
106775.80(6)		9(1, 8) - 8(2, 7)	*AA*	10	1.0
106777.52(9)		9(1, 8) - 8(2, 7)	*EE*	16	1.0
106779.24(19)		9(1, 8) - 8(2, 7)	*AE*	6	1.0
106779.25(19)		9(1, 8) - 8(2, 7)	*EA*	4	1.0
109571.54(9)		8(2, 7) - 8(1, 8)	*EA*	4	1.0
109571.55(9)		8(2, 7) - 8(1, 8)	*AE*	6	1.0
109574.22(4)		8(2, 7) - 8(1, 8)	*EE*	16	1.0
109576.88(6)		8(2, 7) - 8(1, 8)	*AA*	10	1.0
110232.94(37)		4(4, 1) - 5(3, 2)	*EA*	4	0.12
110245.65(16)		4(4, 1) - 5(3, 2)	*EE*	16	0.26
110248.31(12)		4(4, 1) - 5(3, 2)	*AE*	6	1.0
110256.42(5)		4(4, 1) - 5(3, 2)	*AA*	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3\ ^{16}O\ ^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
110266.63(12)		4(4, 0) - 5(3, 3)	AE	4	1.0
110274.74(5)		4(4, 0) - 5(3, 3)	AA	6	1.0
110277.41(5)		4(4, 0) - 5(3, 3)	EE	16	0.26
110282.01(12)		4(4, 0) - 5(3, 3)	EA	2	0.13
111780.42(42)		7(5, 3) - 8(4, 4)	EA	2	0.01
111782.73(5)		7(0, 7) - 6(1, 6)	AA	10	1.0
111783.26(3)	111783.01 (4)	7(0, 7) - 6(1, 6)	EE	6	1.0
111783.79(7)		7(0, 7) - 6(1, 6)	AE	6	1.0
111783.79(7)		7(0, 7) - 6(1, 6)	EA	4	1.0
111793.23(20)		7(5, 3) - 8(4, 4)	EE	16	0.05
111796.98(11)		7(5, 3) - 8(4, 4)	AE	4	1.0
111802.00(11)		7(5, 2) - 8(4, 5)	AE	6	1.0
111804.39(9)		7(5, 3) - 8(4, 4)	AA	6	1.0
111809.41(9)		7(5, 2) - 8(4, 5)	AA	10	1.0
111813.16(9)		7(5, 2) - 8(4, 5)	EE	16	0.05
111818.57(20)		7(5, 2) - 8(4, 5)	EA	4	0.01
112371.39(16)		15(2,14) - 14(3,11)	AA	6	1.0
112374.08(6)		15(2,14) - 14(3,11)	EE	16	1.0
112376.73(12)		15(2,14) - 14(3,11)	EA	2	1.0
112376.76(12)		15(2,14) - 14(3,11)	AE	4	1.0
113260.67(35)		10(6, 5) - 11(5, 6)	EA	4	1.0
113269.78(18)		10(6, 5) - 11(5, 6)	EE	16	1.0
113272.95(7)		10(6, 5) - 11(5, 6)	AE	6	1.0
113274.09(7)		10(6, 4) - 11(5, 7)	AE	4	1.0
113278.39(18)		10(6, 5) - 11(5, 6)	AA	10	1.0
113279.53(18)		10(6, 4) - 11(5, 7)	AA	6	1.0
113282.72(10)		10(6, 4) - 11(5, 7)	EE	16	1.0
113286.39(20)		10(6, 4) - 11(5, 7)	EA	2	1.0
114691.13(15)		13(7, 7) - 14(6, 8)	EA	2	0.00
114695.04(7)		13(7, 7) - 14(6, 8)	EE	16	0.01
114696.07(6)		13(7, 7) - 14(6, 8)	AE	4	1.0
114696.30(6)		13(7, 6) - 14(6, 9)	AE	6	1.0
114698.82(33)		13(7, 7) - 14(6, 8)	AA	6	1.0
114699.05(33)		13(7, 6) - 14(6, 9)	AA	10	1.0
114700.11(7)		13(7, 6) - 14(6, 9)	EE	16	0.01
114701.27(15)		13(7, 6) - 14(6, 9)	EA	4	0.00
115072.48(10)		9(2, 8) - 9(1, 9)	EA	2	1.0
115072.49(10)		9(2, 8) - 9(1, 9)	AE	4	1.0
115075.20(5)		9(2, 8) - 9(1, 9)	EE	16	1.0
115077.91(7)		9(2, 8) - 9(1, 9)	AA	6	1.0
115544.03(4)		5(1, 5) - 4(0, 4)	AE	2	1.0
115544.03(4)		5(1, 5) - 4(0, 4)	EA	4	1.0
115544.84(2)	115544.62 (10)	5(1, 5) - 4(0, 4)	EE	16	1.0
115545.65(6)		5(1, 5) - 4(0, 4)	AA	6	1.0
118299.17(31)		15(3,12) - 15(2,13)	AE	6	1.0
118299.20(31)		15(3,12) - 15(2,13)	EA	4	1.0
118301.48(15)		15(3,12) - 15(2,13)	EE	16	1.0
118303.79(22)		15(3,12) - 15(2,13)	AA	10	1.0
118582.92(32)		14(1,13) - 14(0,14)	AE	4	1.0
118582.92(32)		14(1,13) - 14(0,14)	EA	2	1.0
118585.03(16)		14(1,13) - 14(0,14)	EE	16	1.0
118587.14(16)		14(1,13) - 14(0,14)	AA	6	1.0
121197.52(12)		10(2, 9) - 10(1,10)	EA	4	1.0
121197.52(12)		10(2, 9) - 10(1,10)	AE	6	1.0
121200.28(6)		10(2, 9) - 10(1,10)	EE	16	1.0
121203.05(9)		10(2, 9) - 10(1,10)	AA	10	1.0
121842.95(30)		14(3,11) - 14(2,12)	AE	4	1.0
121842.98(30)		14(3,11) - 14(2,12)	EA	2	1.0
121845.45(15)		14(3,11) - 14(2,12)	EE	16	1.0
121847.95(21)		14(3,11) - 14(2,12)	AA	6	1.0
125242.95(12)		2(2, 1) - 1(1, 0)	EA	4	0.95
125244.87(7)		2(2, 1) - 1(1, 0)	AE	6	1.0
125246.88(4)		2(2, 1) - 1(1, 0)	EE	16	0.99
125249.88(6)		2(2, 1) - 1(1, 0)	AA	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
125675.72(30)		13(3,10) - 13(2,11)	*AE*	6	1.0
125675.74(29)		13(3,10) - 13(2,11)	*EA*	4	1.0
125678.43(15)		13(3,10) - 13(2,11)	*EE*	16	1.0
125681.13(19)		13(3,10) - 13(2,11)	*AA*	10	1.0
126218.31(8)		13(2,11) - 12(3,10)	*AA*	10	1.0
126220.95(17)		13(2,11) - 12(3,10)	*EE*	16	1.0
126223.59(35)		13(2,11) - 12(3,10)	*AE*	6	1.0
126223.61(35)		13(2,11) - 12(3,10)	*EA*	4	1.0
126449.55(6)		2(2, 0) - 1(1, 1)	*AE*	4	1.0
126451.48(2)		2(2, 0) - 1(1, 1)	*EA*	2	0.95
126452.57(2)		2(2, 0) - 1(1, 1)	*EE*	16	0.99
126454.60(6)		2(2, 0) - 1(1, 1)	*AA*	16	1.0
127934.34(13)		11(2.10) - 11(1.11)	*EA*	2	1.0
127934.34(13)		11(2,10) - 11(1,11)	*AE*	4	1.0
127937.17(6)		11(2,10) - 11(1,11)	*EE*	16	1.0
127940.00(12)		11(2,10) - 11(1,11)	*AA*	6	1.0
129556.15(28)		12(3, 9) - 12(2,10)	*AE*	4	1.0
129556.18(28)		12(3, 9) - 12(2,10)	*EA*	2	1.0
129559.03(14)		12(3, 9) - 12(2,10)	*EE*	16	1.0
129561.90(17)		12(3, 9) - 12(2,10)	*AA*	6	1.0
130516.45(6)		10(1, 9) - 9(2, 8)	*AA*	6	1.0
130518.02(10)		10(1, 9) - 9(2, 8)	*EE*	16	1.0
130519.59(21)		10(1, 9) - 9(2, 8)	*AE*	4	1.0
130519.60(21)		10(1, 9) - 9(2, 8)	*EA*	2	1.0
130836.42(39)		6(5, 2) - 7(4, 3)	*EA*	4	1.0
130849.69(19)		6(5, 2) - 7(4, 3)	*EE*	16	1.0
130854.71(10)		6(5, 2) - 7(4, 3)	*AE*	6	1.0
130856.39(10)		6(5, 1) - 7(4, 4)	*AE*	4	1.0
130862.23(10)		6(5, 2) - 7(4, 3)	*AA*	10	1.0
130863.91(10)		6(5, 1) - 7(4, 4)	*AA*	6	1.0
130868.93(9)		6(5, 1) - 7(4, 4)	*EE*	16	1.0
130874.68(19)		6(5, 1) - 7(4, 4)	*EA*	2	1.0
131405.08(4)		6(1, 6) - 5(0, 5)	*AE*	6	1.0
131405.08(4)		6(1, 6) - 5(0, 5)	*EA*	4	1.0
131405.84(2)		6(1, 6) - 5(0, 5)	*EE*	16	1.0
131406.60(6)		6(1, 6) - 5(0, 5)	*AA*	10	1.0
131907.37(35)		15(1,14) - 15(0,15)	*EA*	4	1.0
131907.37(35)		15(1,14) - 15(0,15)	*AE*	6	1.0
131909.72(17)		15(1,14) - 15(0,15)	*EE*	16	1.0
131912.06(22)		15(1,14) - 15(0,15)	*AA*	10	1.0
132349.30(32)		9(6, 4) - 10(5, 5)	*EA*	2	0.00
132358.68(15)		9(6, 4) - 10(5, 5)	*EE*	16	0.00
132362.29(7)		9(6, 4) - 10(5, 5)	*AE*	4	1.0
132362.72(7)		9(6, 3) - 10(5, 6)	*AE*	6	1.0
132367.85(19)		9(6, 4) - 10(5, 5)	*AA*	6	1.0
132368.28(19)		9(6, 3) - 10(5, 6)	*AA*	10	1.0
132371.89(8)		9(6, 3) - 10(5, 6)	*EE*	16	0.00
132375.70(17)		9(6, 3) - 10(5, 6)	*EA*	4	0.00
132524.95(5)		8(0, 8) - 7(1, 7)	*AA*	6	1.0
132525.39(3)		8(0, 8) - 7(1, 7)	*EE*	16	1.0
132525.84(7)		8(0, 8) - 7(1, 7)	*EA*	2	1.0
132525.84(7)		8(0, 8) - 7(1, 7)	*AE*	4	1.0
133265.35(25)		11(3, 8) - 11(2, 9)	*AE*	6	1.0
133265.40(25)		11(3, 8) - 11(2, 9)	*EA*	4	1.0
133268.38(12)		11(3, 8) - 11(2, 9)	*EE*	16	1.0
133271.38(15)		11(3, 8) - 11(2, 9)	*AA*	10	1.0
133802.67(12)		12(7, 6) - 13(6, 7)	*EA*	2	0.00
133806.70(5)		12(7, 6) - 13(6, 7)	*EE*	16	0.00
133807.89(7)		12(7, 6) - 13(6, 7)	*AE*	4	1.0
133807.99(7)		12(7, 5) - 13(6, 8)	*AE*	4	1.0
133810.64(34)		12(7, 6) - 13(6, 7)	*AA*	6	1.0
133810.74(34)		12(7, 5) - 13(6, 8)	*AA*	6	1.0
133811.96(6)		12(7, 5) - 13(6, 8)	*EE*	16	0.00
133813.24(13)		12(7, 5) - 13(6, 8)	*EA*	2	0.00

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
135263.89(15)		12(2,11) - 12(1,12)	*EA*	4	1.0
135263.89(15)		12(2,11) - 12(1,12)	*AE*	6	1.0
135266.78(7)		12(2,11) - 12(1,12)	*EE*	16	1.0
135269.67(15)		12(2,11) - 12(1,12)	*AA*	10	1.0
136622.93(23)		10(3, 7) - 10(2, 8)	*AE*	4	1.0
136623.02(23)		10(3, 7) - 10(2, 8)	*EA*	2	1.0
136626.12(11)		10(3, 7) - 10(2, 8)	*EE*	16	1.0
136629.24(12)		10(3, 7) - 10(2, 8)	*AA*	6	1.0
139500.40(21)		9(3, 6) - 9(2, 7)	*AE*	6	1.0
139500.55(20)		9(3, 6) - 9(2, 7)	*EA*	4	1.0
139503.72(10)		9(3, 6) - 9(2, 7)	*EE*	16	1.0
139506.95(10)		9(3, 6) - 9(2, 7)	*AA*	10	1.0
141828.88(18)		8(3, 5) - 8(2, 6)	*AE*	4	1.0
141829.19(17)		8(3, 5) - 8(2, 6)	*EA*	2	1.0
141832.31(8)		8(3, 5) - 8(2, 6)	*EE*	16	1.0
141835.58(8)		8(3, 5) - 8(2, 6)	*AA*	6	1.0
143018.02(8)		3(2, 2) - 2(1, 1)	*EA*	2	1.0
143018.42(7)		3(2, 2) - 2(1, 1)	*AE*	4	1.0
143020.81(4)		3(2, 2) - 2(1, 1)	*EE*	16	1.0
143023.39(7)		3(2, 2) - 2(1, 1)	*AA*	6	1.0
143160.22(17)		13(2,12) - 13(1,13)	*AE*	4	1.0
143160.22(17)		13(2,12) - 13(1,13)	*EA*	2	1.0
143163.19(8)		13(2,12) - 13(1,13)	*EE*	16	1.0
143166.16(20)		13(2,12) - 13(1,13)	*AA*	6	1.0
143599.44(16)		7(3, 4) - 7(2, 5)	*AE*	6	1.0
143600.16(13)		7(3, 4) - 7(2, 5)	*EA*	4	1.0
143603.06(7)		7(3, 4) - 7(2, 5)	*EE*	16	1.0
143606.30(7)		7(3, 4) - 7(2, 5)	*AA*	10	1.0
144855.12(14)		6(3, 3) - 6(2, 4)	*AE*	4	1.0
144856.93(8)		6(3, 3) - 6(2, 4)	*EA*	2	0.97
144859.07(5)		6(3, 3) - 6(2, 4)	*EE*	16	0.99
144862.10(6)		6(3, 3) - 6(2, 4)	*AA*	6	1.0
145675.66(12)		5(3, 2) - 5(2, 3)	*AE*	6	1.0
145680.26(2)		5(3, 2) - 5(2, 3)	*EA*	4	0.84
145680.54(2)		5(3, 2) - 5(2, 3)	*EE*	16	0.94
145682.73(6)		5(3, 2) - 5(2, 3)	*AA*	10	1.0
146159.49(11)		4(3, 1) - 4(2, 2)	*AE*	6	1.0
146166.46(2)		4(3, 1) - 4(2, 2)	*EE*	16	0.71
146166.65(6)		4(3, 1) - 4(2, 2)	*AA*	10	1.0
146167.78(5)		4(3, 1) - 4(2, 2)	*EA*	4	0.62
146407.13(11)		3(3, 0) - 3(2, 1)	*AE*	6	1.0
146414.35(6)		3(3, 0) - 3(2, 1)	*AA*	10	1.0
146415.60(2)		3(3, 0) - 3(2, 1)	*EE*	16	0.56
146416.96(4)		3(3, 0) - 3(2, 1)	*EA*	4	0.56
146571.39(23)		3(3, 1) - 3(2, 2)	*EA*	2	0.56
146579.98(12)		3(3, 1) - 3(2, 2)	*EE*	16	0.56
146581.23(11)		3(3, 1) - 3(2, 2)	*AE*	4	1.0
146588.45(6)		3(3, 1) - 3(2, 2)	*AA*	6	1.0
146669.37(25)		4(3, 2) - 4(2, 3)	*EA*	2	0.62
146677.65(11)		4(3, 2) - 4(2, 3)	*AE*	4	1.0
146677.85(12)		4(3, 2) - 4(2, 3)	*EE*	16	0.71
146684.81(6)		4(3, 2) - 4(2, 3)	*AA*	6	1.0
146702.14(6)		3(2, 1) - 2(1, 2)	*AE*	6	1.0
146702.54(5)		3(2, 1) - 2(1, 2)	*EA*	4	1.0
146704.79(2)		3(2, 1) - 2(1, 2)	*EE*	16	1.0
146707.23(7)		3(2, 1) - 2(1, 2)	*AA*	10	1.0
146865.73(23)		5(3, 3) - 5(2, 4)	*EA*	2	0.84
146870.33(11)		5(3, 3) - 5(2, 4)	*AE*	4	1.0
146872.52(9)		5(3, 3) - 5(2, 4)	*EE*	16	0.94
146877.41(6)		5(3, 3) - 5(2, 4)	*AA*	6	1.0
147024.23(5)		7(1, 7) - 6(0, 6)	*EA*	2	1.0
147024.23(5)		7(1, 7) - 6(0, 6)	*AE*	4	1.0
147024.94(2)		7(1, 7) - 6(0, 6)	*EE*	16	1.0
147025.65(7)		7(1, 7) - 6(0, 6)	*AA*	6	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
147202.01(18)		6(3, 4) - 6(2, 5)	EA	4	0.97
147203.83(12)		6(3, 4) - 6(2, 5)	AE	6	1.0
147206.86(7)		6(3, 4) - 6(2, 5)	EE	16	0.99
147210.81(6)		6(3, 4) - 6(2, 5)	AA	10	1.0
147727.46(15)		7(3, 5) - 7(2, 6)	EA	2	1.0
147728.18(13)		7(3, 5) - 7(2, 6)	AE	4	1.0
147731.43(7)		7(3, 5) - 7(2, 6)	EE	16	1.0
147735.05(6)		7(3, 5) - 7(2, 6)	AA	6	1.0
148496.86(15)		8(3, 6) - 8(2, 7)	EA	4	1.0
148497.17(14)		8(3, 6) - 8(2, 7)	AE	6	1.0
148500.48(7)		8(3, 6) - 8(2, 7)	EE	16	1.0
148503.94(7)		8(3, 6) - 8(2, 7)	AA	10	1.0
149566.46(15)		9(3, 7) - 9(2, 8)	EA	2	1.0
149566.59(15)		9(3, 7) - 9(2, 8)	AE	4	1.0
149569.88(7)		9(3, 7) - 9(2, 8)	EE	16	1.0
149573.23(8)		9(3, 7) - 9(2, 8)	AA	6	1.0
149859.39(35)		5(5, 1) - 6(4, 2)	EA	2	1.0
149872.88(17)		5(5, 1) - 6(4, 2)	EE	16	1.0
149878.53(9)		5(5, 1) - 6(4, 2)	AE	4	1.0
149878.99(9)		5(5, 0) - 6(4, 3)	AE	6	1.0
149886.14(10)		5(5, 1) - 6(4, 2)	AA	6	1.0
149886.60(10)		5(5, 0) - 6(4, 3)	AA	10	1.0
149892.25(8)		5(5, 0) - 6(4, 3)	EE	16	1.0
149898.12(17)		5(5, 0) - 6(4, 3)	EA	4	1.0
150992.22(15)		10(3, 8) - 10(2, 9)	EA	4	1.0
150992.30(14)		10(3, 8) - 10(2, 9)	AE	6	1.0
150995.52(7)		10(3, 8) - 10(2, 9)	EE	16	1.0
150998.77(10)		10(3, 8) - 10(2, 9)	AA	10	1.0
151405.51(27)		8(6, 3) - 9(5, 4)	EA	4	0.00
151415.07(14)		8(6, 3) - 9(5, 4)	EE	16	0.00
151418.96(8)		8(6, 3) - 9(5, 4)	AE	6	1.0
151419.11(8)		8(6, 2) - 9(5, 5)	AE	4	1.0
151424.59(19)		8(6, 3) - 9(5, 4)	AA	10	1.0
151424.73(19)		8(6, 2) - 9(5, 5)	AA	6	1.0
151428.61(9)		8(6, 2) - 9(5, 5)	EE	16	0.00
151432.54(17)		8(6, 2) - 9(5, 5)	EA	2	0.00
151510.97(8)		14(2,12) - 13(3,11)	AA	6	1.0
151513.41(18)		14(2,12) - 13(3,11)	EE	16	1.0
151515.85(37)		14(2,12) - 13(3,11)	AE	4	1.0
151515.86(37)		14(2,12) - 13(3,11)	EA	2	1.0
151591.05(18)		14(2,13) - 14(1,14)	EA	4	1.0
151591.05(18)		14(2,13) - 14(1,14)	AE	6	1.0
151594.12(9)		14(2,13) - 14(1,14)	EE	16	1.0
151597.18(25)		14(2,13) - 14(1,14)	AA	10	1.0
152828.29(15)		11(3, 9) - 11(2,10)	EA	2	1.0
152828.33(15)		11(3, 9) - 11(2,10)	AE	4	1.0
152831.48(8)		11(3, 9) - 11(2,10)	EE	16	1.0
152834.67(12)		11(3, 9) - 11(2,10)	AA	6	1.0
152883.57(11)		11(7, 5) - 12(6, 6)	EA	2	0.00
152887.69(5)		11(7, 5) - 12(6, 6)	EE	16	0.01
152889.04(8)		11(7, 5) - 12(6, 6)	AE	4	1.0
152889.07(8)		11(7, 4) - 12(6, 7)	AE	6	1.0
152891.85(35)		11(7, 5) - 12(6, 6)	AA	6	1.0
152891.88(35)		11(7, 4) - 12(6, 7)	AA	10	1.0
152893.19(6)		11(7, 4) - 12(6, 7)	EE	16	0.01
152894.51(12)		11(7, 4) - 12(6, 7)	EA	4	0.00
153054.61(6)		9(0, 9) - 8(1, 8)	AA	10	1.0
153054.97(3)		9(0, 9) - 8(1, 8)	EE	16	1.0
153055.33(7)		9(0, 9) - 8(1, 8)	EA	4	1.0
153055.33(7)		9(0, 9) - 8(1, 8)	AE	6	1.0
154296.89(6)		14(8, 7) - 15(7, 8)	EA	4	0.01
154298.73(3)		14(8, 7) - 15(7, 8)	EE	16	0.01
154300.61(56)		14(8, 7) - 15(7, 8)	AA	10	1.0
154300.62(56)		14(8, 6) - 15(7, 9)	AA	6	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
154300.73(12)		14(8, 7) - 15(7, 8)	AE	6	1.0
154300.74(12)		14(8, 6) - 15(7, 9)	AE	4	1.0
154302.65(13)		14(8, 6) - 15(7, 9)	EE	16	0.01
154304.62(25)		14(8, 6) - 15(7, 9)	EA	2	0.01
154453.81(7)		11(1,10) - 10(2, 9)	AA	10	1.0
154455.22(11)		11(1,10) - 10(2, 9)	EE	16	1.0
154456.62(22)		11(1,10) - 10(2, 9)	AE	6	1.0
154456.62(22)		11(1,10) - 10(2, 9)	EA	4	1.0
155125.45(16)		12(3,10) - 12(2,11)	EA	4	1.0
155125.46(16)		12(3,10) - 12(2,11)	AE	6	1.0
155128.56(8)		12(3,10) - 12(2,11)	EE	16	1.0
155131.65(14)		12(3,10) - 12(2,11)	AA	10	1.0
157929.45(15)		13(3,11) - 13(2,12)	EA	2	1.0
157929.47(15)		13(3,11) - 13(2,12)	AE	4	1.0
157932.48(7)		13(3,11) - 13(2,12)	EE	16	1.0
157935.50(17)		13(3,11) - 13(2,12)	AA	6	1.0
160201.58(8)		4(2, 3) - 3(1, 2)	EA	4	1.0
160201.71(8)		4(2, 3) - 3(1, 2)	AE	6	1.0
160204.13(4)		4(2, 3) - 3(1, 2)	EE	16	1.0
160206.62(7)		4(2, 3) - 3(1, 2)	AA	10	1.0
160518.59(20)		15(2,14) - 15(1,15)	AE	4	1.0
160518.59(20)		15(2,14) - 15(1,15)	EA	2	1.0
160521.74(10)		15(2,14) - 15(1,15)	EE	16	1.0
160524.90(32)		15(2,14) - 15(1,15)	AA	6	1.0
161279.85(17)		14(3,12) - 14(2,13)	AE	6	1.0
161279.85(17)		14(3,12) - 14(2,13)	EA	4	1.0
161282.81(8)		14(3,12) - 14(2,13)	EE	16	1.0
161285.76(19)		14(3,12) - 14(2,13)	AA	10	1.0
162528.97(6)		8(1, 8) - 7(0, 7)	EA	4	1.0
162528.97(6)		8(1, 8) - 7(0, 7)	AE	6	1.0
162529.62(3)		8(1, 8) - 7(0, 7)	EE	16	1.0
162530.27(8)		8(1, 8) - 7(0, 7)	AA	10	1.0
165208.98(15)		15(3,13) - 15(2,14)	AE	4	1.0
165208.98(15)		15(3,13) - 15(2,14)	EA	2	1.0
165211.83(7)		15(3,13) - 15(2,14)	EE	16	1.0
165214.67(23)		15(3,13) - 15(2,14)	AA	6	1.0
167741.49(7)		4(2, 2) - 3(1, 3)	AE	4	1.0
167741.62(7)		4(2, 2) - 3(1, 3)	EA	2	1.0
167744.09(3)		4(2, 2) - 3(1, 3)	EE	16	1.0
167746.63(7)		4(2, 2) - 3(1, 3)	AA	6	1.0
170434.66(24)		7(6, 2) - 8(5, 3)	EA	2	0.00
170444.40(12)		7(6, 2) - 8(5, 3)	EE	16	0.00
170448.41(9)		7(6, 2) - 8(5, 3)	AE	4	1.0
170448.45(9)		7(6, 1) - 8(5, 4)	AE	6	1.0
170454.13(20)		7(6, 2) - 8(5, 3)	AA	6	1.0
170454.17(20)		7(6, 1) - 8(5, 4)	AA	10	1.0
170458.19(7)		7(6, 1) - 8(5, 4)	EE	16	0.00
170462.20(14)		7(6, 1) - 8(5, 4)	EA	4	0.00
171937.99(15)		10(7, 4) - 11(6, 5)	EA	4	1.0
171942.27(7)		10(7, 4) - 11(6, 5)	EE	16	1.0
171943.64(10)		10(7, 4) - 11(6, 5)	AE	6	1.0
171943.65(10)		10(7, 3) - 11(6, 6)	AE	4	1.0
171946.52(35)		10(7, 4) - 11(6, 5)	AA	10	1.0
171946.53(35)		10(7, 3) - 11(6, 6)	AA	6	1.0
171947.90(4)		10(7, 3) - 11(6, 6)	EE	16	1.0
171949.31(10)		10(7, 3) - 11(6, 6)	EA	2	1.0
173292.83(7)		10(0,10) - 9(1, 9)	AA	6	1.0
173293.10(3)		10(0,10) - 9(1, 9)	EE	16	1.0
173293.38(7)		10(0,10) - 9(1, 9)	AE	4	1.0
173293.38(7)		10(0,10) - 9(1, 9)	EA	2	1.0
173369.34(8)		13(8, 6) - 14(7, 7)	EA	2	1.0
173371.24(4)		13(8, 6) - 14(7, 7)	EE	16	1.0
173373.21(57)		13(8, 6) - 14(7, 7)	AA	6	1.0
173373.22(57)		13(8, 5) - 14(7, 8)	AA	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
173373.40(10)		13(8, 6) - 14(7, 7)	AE	4	1.0
173373.41(10)		13(8, 5) - 14(7, 8)	AE	6	1.0
173375.38(11)		13(8, 5) - 14(7, 8)	EE	16	1.0
173377.47(22)		13(8, 5) - 14(7, 8)	EA	4	1.0
176798.89(9)		5(2, 4) - 4(1, 3)	EA	2	1.0
176798.95(9)		5(2, 4) - 4(1, 3)	AE	4	1.0
176801.34(4)		5(2, 4) - 4(1, 3)	EE	16	1.0
176803.76(8)		5(2, 4) - 4(1, 3)	AA	6	1.0
177347.03(10)		15(2,13) - 14(3,12)	AA	10	1.0
177349.28(21)		15(2,13) - 14(3,12)	EE	16	1.0
177351.53(42)		15(2,13) - 14(3,12)	AE	6	1.0
177351.53(42)		15(2,13) - 14(3,12)	EA	4	1.0
178044.53(5)		9(1, 9) - 8(0, 8)	EA	2	1.0
178044.53(5)		9(1, 9) - 8(0, 8)	AE	4	1.0
178045.11(2)		9(1, 9) - 8(0, 8)	EE	16	1.0
178045.69(8)		9(1, 9) - 8(0, 8)	AA	6	1.0
178484.34(8)		12(1,11) - 11(2,10)	AA	6	1.0
178485.59(11)		12(1,11) - 11(2,10)	EE	16	1.0
178486.84(23)		12(1,11) - 11(2,10)	AE	4	1.0
178486.84(23)		12(1,11) - 11(2,10)	EA	2	1.0
189441.66(28)		6(6, 1) - 7(5, 2)	EA	4	0.00
189451.57(14)		6(6, 1) - 7(5, 2)	EE	16	0.00
189455.68(10)		6(6, 1) - 7(5, 2)	AE	6	1.0
189455.68(10)		6(6, 0) - 7(5, 3)	AE	4	1.0
189461.46(21)		6(6, 0) - 7(5, 3)	AA	6	1.0
189461.46(21)		6(6, 1) - 7(5, 2)	AA	10	1.0
189465.57(6)		6(6, 0) - 7(5, 3)	EE	16	0.00
189469.70(13)		6(6, 0) - 7(5, 3)	EA	2	0.00
189702.92(8)		5(2, 3) - 4(1, 4)	AE	6	1.0
189702.97(8)		5(2, 3) - 4(1, 4)	EA	4	1.0
189705.54(4)		5(2, 3) - 4(1, 4)	EE	16	1.0
189708.13(8)		5(2, 3) - 4(1, 4)	AA	10	1.0
190969.75(16)		9(7, 3) - 10(6, 4)	EA	2	1.0
190974.10(8)		9(7, 3) - 10(6, 4)	EE	16	1.0
190975.56(9)		9(7, 3) - 10(6, 4)	AE	4	1.0
190975.56(9)		9(7, 2) - 10(6, 5)	AE	6	1.0
190978.44(36)		9(7, 3) - 10(6, 4)	AA	6	1.0
190978.44(36)		9(7, 2) - 10(6, 5)	AA	10	1.0
190979.88(5)		9(7, 2) - 10(6, 5)	EE	16	1.0
190981.35(9)		9(7, 2) - 10(6, 5)	EA	4	1.0
192419.77(9)		12(8, 5) - 13(7, 6)	EA	2	1.0
192421.77(4)		12(8, 5) - 13(7, 6)	EE	16	1.0
192423.80(58)		12(8, 5) - 13(7, 6)	AA	6	1.0
192423.80(58)		12(8, 4) - 13(7, 7)	AA	6	1.0
192423.99(10)		12(8, 5) - 13(7, 6)	AE	4	1.0
192423.99(10)		12(8, 4) - 13(7, 7)	AE	4	1.0
192425.99(10)		12(8. 4) - 13(7. 7)	EE	16	1.0
192428.18(21)		12(8, 4) - 13(7, 7)	EA	2	1.0
192819.27(10)		6(2, 5) - 5(1, 4)	EA	4	1.0
192819.29(10)		6(2, 5) - 5(1, 4)	AE	6	1.0
192821.63(5)		6(2, 5) - 5(1, 4)	EE	16	1.0
192823.98(9)		6(2, 5) - 5(1, 4)	AA	10	1.0
193196.49(8)		11(0,11) - 10(1,10)	AA	10	1.0
193196.69(3)		11(0,11) - 10(1,10)	EE	16	1.0
193196.90(6)		11(0,11) - 10(1,10)	EA	4	1.0
193196.90(6)		11(0,11) - 10(1,10)	AE	6	1.0
193679.67(5)		10(1,10) - 9(0, 9)	EA	4	1.0
193679.67(5)		10(1,10) - 9(0, 9)	AE	6	1.0
193680.18(2)		10(1,10) - 9(0, 9)	EE	16	1.0
193680.69(9)		10(1,10) - 9(0, 9)	AA	10	1.0
195144.34(34)		15(4,11) - 15(3,12)	AE	6	1.0
195144.40(34)		15(4,11) - 15(3,12)	EA	4	1.0
195147.47(17)		15(4,11) - 15(3,12)	EE	16	1.0
195150.53(39)		15(4,11) - 15(3,12)	AA	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3\ ^{16}O\ ^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
197826.07(30)		14(4,10) - 14(3,11)	*AE*	4	1.0
197826.20(30)		14(4,10) - 14(3,11)	*EA*	2	1.0
197829.35(15)		14(4,10) - 14(3,11)	*EE*	16	1.0
197832.57(33)		14(4,10) - 14(3,11)	*AA*	6	1.0
199932.81(26)		13(4, 9) - 13(3,10)	*AE*	6	1.0
199933.11(25)		13(4, 9) - 13(3,10)	*EA*	4	1.0
199936.25(12)		13(4, 9) - 13(3,10)	*EE*	16	1.0
199939.50(28)		13(4, 9) - 13(3,10)	*AA*	10	1.0
201536.15(24)		12(4, 8) - 12(3, 9)	*AE*	4	1.0
201536.76(20)		12(4, 8) - 12(3, 9)	*EA*	2	1.0
201539.79(10)		12(4, 8) - 12(3, 9)	*EE*	16	1.0
201543.09(23)		12(4, 8) - 12(3, 9)	*AA*	6	1.0
202490.54(10)		13(1,12) - 12(2,11)	*AA*	10	1.0
202491.60(11)		13(1,12) - 12(2,11)	*EE*	16	1.0
202492.66(23)		13(1,12) - 12(2,11)	*EA*	4	1.0
202492.66(23)		13(1,12) - 12(2,11)	*AE*	6	1.0
202719.34(22)		11(4, 7) - 11(3, 8)	*AE*	6	1.0
202720.64(16)		11(4, 7) - 11(3, 8)	*EA*	4	1.0
202723.26(9)		11(4, 7) - 11(3, 8)	*EE*	16	1.0
202726.53(19)		11(4, 7) - 11(3, 8)	*AA*	10	1.0
203363.74(28)		3(3, 1) - 2(2, 0)	*EA*	2	0.30
203374.07(13)		3(3, 1) - 2(2, 0)	*EE*	16	0.41
203375.87(10)		3(3, 1) - 2(2, 0)	*AE*	4	1.0
203383.17(9)		3(3, 1) - 2(2, 0)	*AA*	6	1.0
203411.52(10)		3(3, 0) - 2(2, 1)	*AE*	6	1.0
203418.82(9)		3(3, 0) - 2(2, 1)	*AA*	10	1.0
203420.63(3)		3(3, 0) - 2(2, 1)	*EE*	16	0.41
203423.66(8)		3(3, 0) - 2(2, 1)	*EA*	4	0.30
203566.01(19)		10(4, 6) - 10(3, 7)	*AE*	4	1.0
203568.74(8)		10(4, 6) - 10(3, 7)	*EA*	2	0.93
203570.43(6)		10(4, 6) - 10(3, 7)	*EE*	16	0.98
203573.38(15)		10(4, 6) - 10(3, 7)	*AA*	6	1.0
204152.79(16)		9(4, 5) - 9(3, 6)	*AE*	6	1.0
204157.99(3)		9(4, 5) - 9(3, 6)	*EA*	4	0.79
204158.18(1)		9(4, 5) - 9(3, 6)	*EE*	16	0.90
204160.29(12)		9(4, 5) - 9(3, 6)	*AA*	10	1.0
204517.51(25)		12(4, 9) - 12(3,10)	*EA*	4	1.0
204518.12(21)		12(4, 9) - 12(3,10)	*AE*	6	1.0
204521.42(12)		12(4, 9) - 12(3,10)	*EE*	16	1.0
204525.03(21)		12(4, 9) - 12(3,10)	*AA*	10	1.0
204545.48(17)		8(4, 4) - 8(3, 5)	*AE*	4	1.0
204548.07(28)		11(4, 8) - 11(3, 9)	*EA*	2	1.0
204549.36(21)		11(4, 8) - 11(3, 9)	*AE*	4	1.0
204552.40(1)		8(4, 4) - 8(3, 5)	*EE*	16	0.74
204552.63(12)		11(4, 8) - 11(3, 9)	*EE*	16	1.0
204553.07(2)		8(4, 4) - 8(3, 5)	*EA*	2	0.65
204553.20(10)		8(4, 4) - 8(3, 5)	*AA*	6	1.0
204556.52(17)		11(4, 8) - 11(3, 9)	*AA*	6	1.0
204572.29(27)		13(4,10) - 13(3,11)	*EA*	2	1.0
204572.59(25)		13(4,10) - 13(3,11)	*AE*	4	1.0
204575.87(12)		13(4,10) - 13(3,11)	*EE*	16	1.0
204579.28(25)		13(4,10) - 13(3,11)	*AA*	6	1.0
204628.09(31)		10(4, 7) - 10(3, 8)	*EA*	4	0.93
204630.82(19)		10(4, 7) - 10(3, 8)	*AE*	6	1.0
204633.78(13)		10(4, 7) - 10(3, 8)	*EE*	16	0.98
204638.20(14)		10(4, 7) - 10(3, 8)	*AA*	10	1.0
204729.29(33)		9(4, 6) - 9(3, 7)	*EA*	2	0.79
204734.49(16)		9(4, 6) - 9(3, 7)	*AE*	4	1.0
204736.60(14)		9(4, 6) - 9(3, 7)	*EE*	16	0.90
204741.99(12)		9(4, 6) - 9(3, 7)	*AA*	6	1.0
204755.32(25)		14(4,11) - 14(3,12)	*EA*	4	1.0
204755.47(24)		14(4,11) - 14(3,12)	*AE*	6	1.0
204758.63(12)		14(4,11) - 14(3,12)	*EE*	16	1.0
204761.85(29)		14(4,11) - 14(3,12)	*AA*	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
204798.19(15)		7(4, 3) - 7(3, 4)	AE	6	1.0
204806.03(8)		7(4, 3) - 7(3, 4)	AA	10	1.0
204806.31(1)		7(4, 3) - 7(3, 4)	EE	16	0.54
204806.97(2)		7(4, 3) - 7(3, 4)	EA	4	0.47
204832.08(34)		8(4, 5) - 8(3, 6)	EA	4	0.65
204839.68(16)		8(4, 5) - 8(3, 6)	AE	6	1.0
204840.47(16)		8(4, 5) - 8(3, 6)	EE	16	0.74
204847.38(9)		8(4, 5) - 8(3, 6)	AA	10	1.0
204924.32(30)		7(4, 4) - 7(3, 5)	EA	2	0.47
204932.82(15)		7(4, 4) - 7(3, 5)	EE	16	0.54
204933.11(15)		7(4, 4) - 7(3, 5)	AE	4	1.0
204940.95(8)		7(4, 4) - 7(3, 5)	AA	6	1.0
204953.19(13)		6(4, 2) - 6(3, 3)	AE	4	1.0
204961.16(7)		6(4, 2) - 6(3, 3)	AA	6	1.0
204961.61(3)		6(4, 2) - 6(3, 3)	EA	2	0.34
204961.72(1)		6(4, 2) - 6(3, 3)	EE	16	0.43
204999.13(24)		6(4, 3) - 6(3, 4)	EA	4	0.34
205006.98(13)		6(4, 3) - 6(3, 4)	EE	16	0.43
205007.53(13)		6(4, 3) - 6(3, 4)	AE	6	1.0
205015.50(7)		6(4, 3) - 6(3, 4)	AA	10	1.0
205042.64(12)		5(4, 1) - 5(3, 2)	AE	4	1.0
205048.55(9)		5(4, 1) - 5(3, 2)	EA	2	0.88
205050.57(2)		5(4, 1) - 5(3, 2)	EE	16	0.75
205050.70(7)		5(4, 1) - 5(3, 2)	AA	6	1.0
205054.94(15)		5(4, 2) - 5(3, 3)	EA	2	0.88
205060.85(12)		5(4, 2) - 5(3, 3)	AE	4	1.0
205060.98(9)		5(4, 2) - 5(3, 3)	EE	16	0.75
205068.91(7)		5(4, 2) - 5(3, 3)	AA	6	1.0
205090.06(11)		4(4, 0) - 4(3, 1)	AE	4	1.0
205092.34(10)		4(4, 1) - 4(3, 2)	EA	4	0.99
205092.37(12)		4(4, 0) - 4(3, 1)	EA	2	0.99
205094.64(11)		4(4, 1) - 4(3, 2)	AE	6	1.0
205096.09(5)		4(4, 0) - 4(3, 1)	EE	16	0.96
205096.78(6)		4(4, 1) - 4(3, 2)	EE	16	0.96
205098.22(7)		4(4, 0) - 4(3, 1)	AA	6	1.0
205102.80(7)		4(4, 1) - 4(3, 2)	AA	10	1.0
205115.07(29)		15(4,12) - 15(3,13)	EA	2	1.0
205115.13(29)		15(4,12) - 15(3,13)	AE	4	1.0
205118.20(15)		15(4,12) - 15(3,13)	EE	16	1.0
205121.32(33)		15(4,12) - 15(3,13)	AA	6	1.0
208278.38(11)		7(2, 6) - 6(1, 5)	AE	4	1.0
208278.38(11)		7(2, 6) - 6(1, 5)	EA	2	1.0
208280.66(5)		7(2, 6) - 6(1, 5)	EE	16	1.0
208282.93(10)		7(2, 6) - 6(1, 5)	AA	6	1.0
209515.25(4)		11(1,11) - 10(0,10)	EA	2	1.0
209515.25(4)		11(1,11) - 10(0,10)	AE	4	1.0
209515.60(2)		11(1,11) - 10(0,10)	EE	16	1.0
209516.11(11)		11(1,11) - 10(0,10)	AA	6	1.0
209982.27(19)		8(7, 2) - 9(6, 3)	EA	4	0.00
209986.67(9)		8(7, 2) - 9(6, 3)	EE	16	0.01
209988.20(10)		8(7, 1) - 9(6, 4)	AE	4	1.0
209988.20(10)		8(7, 2) - 9(6, 3)	AE	6	1.0
209991.11(36)		8(7, 2) - 9(6, 3)	AA	10	1.0
209991.11(36)		8(7, 1) - 9(6, 4)	AA	6	1.0
209992.64(4)		8(7, 1) - 9(6, 4)	EE	16	0.01
209994.14(8)		8(7, 1) - 9(6, 4)	EA	2	0.08
211451.05(9)		11(8, 4) - 12(7, 5)	EA	2	0.00
211453.08(4)		11(8, 4) - 12(7, 5)	EE	16	0.00
211455.14(58)		11(8, 4) - 12(7, 5)	AA	6	1.0
211455.14(58)		11(8, 3) - 12(7, 6)	AA	10	1.0
211455.39(11)		11(8, 3) - 12(7, 6)	AE	6	1.0
211455.39(11)		11(8, 4) - 12(7, 5)	AE	4	1.0
211457.42(10)		11(8, 3) - 12(7, 6)	EE	16	0.00
211459.70(21)		11(8, 3) - 12(7, 6)	EA	4	0.00

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
212746.79(10)		6(2, 4) - 5(1, 5)	AE	4	1.0
212746.82(10)		6(2, 4) - 5(1, 5)	EA	2	1.0
212749.44(5)		6(2, 4) - 5(1, 5)	EE	16	1.0
212752.08(9)		6(2, 4) - 5(1, 5)	AA	6	1.0
212755.99(10)		12(0,12) - 11(1,11)	AA	6	1.0
212756.12(2)		12(0,12) - 11(1,11)	EE	16	1.0
212756.24(5)		12(0,12) - 11(1,11)	EA	2	1.0
212756.24(5)		12(0,12) - 11(1,11)	AE	4	1.0
212844.06(17)		14(9, 6) - 15(8, 7)	EA	4	1.0
212847.62(7)		14(9, 6) - 15(8, 7)	EE	16	1.0
212851.15(88)		14(9, 5) - 15(8, 8)	AA	6	1.0
212851.15(88)		14(9, 6) - 15(8, 7)	AA	10	1.0
212854.09(16)		14(9, 5) - 15(8, 8)	AE	4	1.0
212854.09(16)		14(9, 6) - 15(8, 7)	AE	6	1.0
212857.62(24)		14(9, 5) - 15(8, 8)	EE	16	1.0
212864.12(50)		14(9, 5) - 15(8, 8)	EA	2	1.0
222238.67(26)		4(3, 2) - 3(2, 1)	EA	4	0.56
222247.48(10)		4(3, 2) - 3(2, 1)	AE	6	1.0
222247.60(12)		4(3, 2) - 3(2, 1)	EE	16	0.68
222254.74(9)		4(3, 2) - 3(2, 1)	AA	10	1.0
222426.82(10)		4(3, 1) - 3(2, 2)	AE	4	1.0
222433.96(1)		4(3, 1) - 3(2, 2)	EE	16	0.68
222434.08(9)		4(3, 1) - 3(2, 2)	AA	6	1.0
222435.63(4)		4(3, 1) - 3(2, 2)	EA	2	0.56
223200.13(13)		8(2, 7) - 7(1, 6)	AE	6	1.0
223200.13(13)		8(2, 7) - 7(1, 6)	EA	4	1.0
223202.32(6)		8(2, 7) - 7(1, 6)	EE	16	1.0
223204.51(11)		8(2, 7) - 7(1, 6)	AA	10	1.0
225598.77(4)		12(1,12) - 11(0,11)	EA	4	1.0
225598.77(4)		12(1,12) - 11(0,11)	AE	6	1.0
225599.14(2)		12(1,12) - 11(0,11)	EE	16	1.0
225599.52(13)		12(1,12) - 11(0,11)	AA	10	1.0
226346.00(13)		14(1,13) - 13(2,12)	AA	6	1.0
226346.89(12)		14(1,13) - 13(2,12)	EE	16	1.0
226347.78(24)		14(1,13) - 13(2,12)	EA	2	1.0
226347.78(24)		14(1,13) - 13(2,12)	AE	4	1.0
228978.76(21)		7(7, 1) - 8(6, 2)	EA	2	0.00
228983.24(11)		7(7, 1) - 8(6, 2)	EE	16	0.00
228984.83(11)		7(7, 0) - 8(6, 3)	AE	6	1.0
228984.83(11)		7(7, 1) - 8(6, 2)	AE	4	1.0
228987.74(37)		7(7, 0) - 8(6, 3)	AA	10	1.0
228987.74(37)		7(7, 1) - 8(6, 2)	AA	6	1.0
228989.33(3)		7(7, 0) - 8(6, 3)	EE	16	0.00
228990.91(7)		7(7, 0) - 8(6, 3)	EA	4	0.00
230465.75(12)		10(8, 3) - 11(7, 4)	EA	4	0.00
230467.78(5)		10(8, 3) - 11(7, 4)	EE	16	0.01
230469.81(59)		10(8, 2) - 11(7, 5)	AA	6	1.0
230469.81(59)		10(8, 3) - 11(7, 4)	AA	10	1.0
230470.19(11)		10(8, 2) - 11(7, 5)	AE	4	1.0
230470.19(11)		10(8, 3) - 11(7, 4)	AE	6	1.0
230472.22(10)		10(8, 2) - 11(7, 5)	EE	16	0.01
230474.62(21)		10(8, 2) - 11(7, 5)	EA	2	0.00
231872.29(11)		13(9, 5) - 14(8, 6)	EA	2	1.0
231875.82(6)		13(9, 5) - 14(8, 6)	EE	16	1.0
231879.38(89)		13(9, 4) - 14(8, 7)	AA	10	1.0
231879.38(89)		13(9, 5) - 14(8, 6)	AA	6	1.0
231882.57(19)		13(9, 5) - 14(8, 6)	AE	4	1.0
231882.57(19)		13(9, 4) - 14(8, 7)	AE	6	1.0
231886.10(25)		13(9, 4) - 14(8, 7)	EE	16	1.0
231892.82(50)		13(9, 4) - 14(8, 7)	EA	4	1.0
231987.79(13)		13(0,13) - 12(1,12)	AA	10	1.0
231987.87(2)		13(0,13) - 12(1,12)	EE	16	1.0
231987.95(5)		13(0,13) - 12(1,12)	AE	6	1.0
231987.95(5)		13(0,13) - 12(1,12)	EA	4	1.0

TABLE 7. Microwave transitions of $^{12}CH_3\ ^{16}O\ ^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
237046.34(12)		7(2, 5) - 6(1, 6)	*AE*	6	1.0
237046.35(12)		7(2, 5) - 6(1, 6)	*EA*	4	1.0
237049.03(6)		7(2, 5) - 6(1, 6)	*EE*	16	1.0
237051.72(9)		7(2, 5) - 6(1, 6)	*AA*	10	1.0
237618.87(14)		9(2, 8) - 8(1, 7)	*EA*	2	1.0
237618.88(14)		9(2, 8) - 8(1, 7)	*AE*	4	1.0
237620.96(7)		9(2, 8) - 8(1, 7)	*EE*	16	1.0
237623.05(13)		9(2, 8) - 8(1, 7)	*AA*	6	1.0
240978.15(23)		5(3, 3) - 4(2, 2)	*EA*	2	0.82
240982.94(11)		5(3, 3) - 4(2, 2)	*AE*	4	1.0
240985.15(9)		5(3, 3) - 4(2, 2)	*EE*	16	0.93
240990.14(10)		5(3, 3) - 4(2, 2)	*AA*	6	1.0
241523.98(10)		5(3, 2) - 4(2, 3)	*AE*	6	1.0
241528.76(1)		5(3, 2) - 4(2, 3)	*EA*	4	0.82
241528.97(1)		5(3, 2) - 4(2, 3)	*EE*	16	0.93
241531.18(10)		5(3, 2) - 4(2, 3)	*AA*	10	1.0
241946.23(4)		13(1,13) - 12(0,12)	*AE*	4	1.0
241946.23(4)		13(1,13) - 12(0,12)	*EA*	2	1.0
241946.55(2)		13(1,13) - 12(0,12)	*EE*	16	1.0
241946.86(15)		13(1,13) - 12(0,12)	*AA*	6	1.0
249466.13(12)		9(8, 2) - 10(7, 3)	*EA*	2	1.0
249468.16(6)		9(8, 2) - 10(7, 3)	*EE*	16	1.0
249470.22(60)		9(8, 2) - 10(7, 3)	*AA*	6	1.0
249470.22(60)		9(8, 1) - 10(7, 4)	*AA*	10	1.0
249470.66(11)		9(8, 1) - 10(7, 4)	*AE*	6	1.0
249470.66(11)		9(8, 2) - 10(7, 3)	*AE*	4	1.0
249472.72(10)		9(8, 1) - 10(7, 4)	*EE*	16	1.0
249475.19(19)		9(8, 1) - 10(7, 4)	*EA*	4	1.0
249923.61(17)		15(1,14) - 14(2,13)	*AA*	10	1.0
249924.31(11)		15(1,14) - 14(2,13)	*EE*	16	1.0
249925.02(23)		15(1,14) - 14(2,13)	*EA*	4	1.0
249925.02(23)		15(1,14) - 14(2,13)	*AE*	6	1.0
250886.05(8)		12(9, 4) - 13(8, 5)	*EA*	4	0.00
250889.65(4)		12(9, 4) - 13(8, 5)	*EE*	16	0.00
250893.24(90)		12(9, 3) - 13(8, 6)	*AA*	6	1.0
250893.24(90)		12(9, 4) - 13(8, 5)	*AA*	10	1.0
250896.62(20)		12(9, 3) - 13(8, 6)	*AE*	4	1.0
250896.62(20)		12(9, 4) - 13(8, 5)	*AE*	6	1.0
250900.21(24)		12(9, 3) - 13(8, 6)	*EE*	16	0.00
250907.18(49)		12(9, 3) - 13(8, 6)	*EA*	2	0.00
250925.01(17)		14(0,14) - 13(1,13)	*AA*	6	1.0
250925.04(2)		14(0,14) - 13(1,13)	*EE*	16	.
250925.07(4)		14(0,14) - 13(1,13)	*EA*	2	1.0
250925.07(4)		14(0,14) - 13(1,13)	*AE*	4	1.0
251581.73(15)		10(2, 9) - 9(1, 8)	*EA*	4	1.0
251581.73(15)		10(2, 9) - 9(1, 8)	*AE*	6	1.0
251583.70(7)		10(2, 9) - 9(1, 8)	*EE*	16	1.0
251585.67(16)		10(2, 9) - 9(1, 8)	*AA*	10	1.0
258548.77(3)		14(1,14) - 13(0,13)	*EA*	4	1.0
258548.77(3)		14(1,14) - 13(0,13)	*AE*	6	1.0
258549.04(1)		14(1,14) - 13(0,13)	*EE*	16	1.0
258549.30(19)		14(1,14) - 13(0,13)	*AA*	10	1.0
259484.90(18)		6(3, 4) - 5(2, 3)	*EA*	4	0.97
259486.79(12)		6(3, 4) - 5(2, 3)	*AE*	6	1.0
259489.87(7)		6(3, 4) - 5(2, 3)	*EE*	16	0.99
259493.92(10)		6(3, 4) - 5(2, 3)	*AA*	10	1.0
260754.56(11)		6(3, 3) - 5(2, 4)	*AE*	4	1.0
260756.45(5)		6(3, 3) - 5(2, 4)	*EA*	2	0.97
260758.61(4)		6(3, 3) - 5(2, 4)	*EE*	16	0.99
260761.70(10)		6(3, 3) - 5(2, 4)	*AA*	6	1.0
261244.29(26)		15(5,10) - 15(4,11)	*AE*	6	1.0
261245.89(14)		15(5,10) - 15(4,11)	*EA*	4	0.94
261247.64(10)		15(5,10) - 15(4,11)	*EE*	16	0.98
261250.17(46)		15(5,10) - 15(4,11)	*AA*	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3\ ^{16}O\ ^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
261893.39(25)		14(5, 9) - 14(4,10)	*AE*	4	1.0
261896.36(7)		14(5, 9) - 14(4,10)	*EA*	2	0.85
261897.33(6)		14(5, 9) - 14(4,10)	*EE*	16	0.94
261899.52(39)		14(5, 9) - 14(4,10)	*AA*	6	1.0
261951.86(36)		15(5,11) - 15(4,12)	*EA*	2	0.94
261953.49(25)		15(5,11) - 15(4,12)	*AE*	4	1.0
261955.99(14)		15(5,11) - 15(4,12)	*EE*	16	0.98
261959.30(45)		15(5,11) - 15(4,12)	*AA*	6	1.0
262307.30(42)		14(5,10) - 14(4,11)	*EA*	4	0.85
262310.27(24)		14(5,10) - 14(4,11)	*AE*	6	1.0
262312.45(17)		14(5,10) - 14(4,11)	*EE*	16	0.94
262316.39(39)		14(5,10) - 14(4,11)	*AA*	10	1.0
262388.55(22)		13(5, 8) - 13(4, 9)	*AE*	6	1.0
262393.17(2)		13(5, 8) - 13(4, 9)	*EA*	4	0.72
262393.39(3)		13(5, 8) - 13(4, 9)	*EE*	16	0.83
262394.92(33)		13(5, 8) - 13(4, 9)	*AA*	10	1.0
262618.60(39)		13(5, 9) - 13(4,10)	*EA*	2	0.72
262623.23(20)		13(5, 9) - 13(4,10)	*AE*	4	1.0
262624.70(18)		13(5, 9) - 13(4,10)	*EE*	16	0.83
262629.54(33)		13(5, 9) - 13(4,10)	*AA*	6	1.0
262763.13(21)		12(5, 7) - 12(4, 8)	*AE*	4	1.0
262768.89(3)		12(5, 7) - 12(4, 8)	*EA*	2	0.52
262768.94(1)		12(5, 7) - 12(4, 8)	*EE*	16	0.69
262769.72(28)		12(5, 7) - 12(4, 8)	*AA*	6	1.0
262771.50(15)		8(2, 6) - 7(1, 7)	*AE*	4	1.0
262771.52(15)		8(2, 6) - 7(1, 7)	*EA*	2	1.0
262774.25(7)		8(2, 6) - 7(1, 7)	*EE*	16	1.0
262777.00(11)		8(2, 6) - 7(1, 7)	*AA*	6	1.0
262882.91(39)		12(5, 8) - 12(4, 9)	*EA*	2	0.52
262888.70(21)		12(5, 8) - 12(4, 9)	*AE*	4	1.0
262889.46(19)		12(5, 8) - 12(4, 9)	*EE*	16	0.64
262895.29(28)		12(5, 8) - 12(4, 9)	*AA*	6	1.0
263043.58(17)		11(5, 6) - 11(4, 7)	*AE*	6	1.0
263049.58(4)		11(5, 6) - 11(4, 7)	*EA*	4	0.67
263050.03(1)		11(5, 6) - 11(4, 7)	*EE*	16	0.64
263050.33(23)		11(5, 6) - 11(4, 7)	*AA*	10	1.0
263100.95(30)		11(5, 7) - 11(4, 8)	*EA*	2	0.67
263106.95(17)		11(5, 7) - 11(4, 8)	*AE*	4	1.0
263107.25(16)		11(5, 7) - 11(4, 8)	*EE*	16	0.64
263113.70(23)		11(5, 7) - 11(4, 8)	*AA*	6	1.0
263250.65(15)		10(5, 5) - 10(4, 6)	*AE*	4	1.0
263255.71(10)		10(5, 5) - 10(4, 6)	*EA*	2	0.78
263257.18(2)		10(5, 5) - 10(4, 6)	*EE*	16	0.68
263257.56(19)		10(5, 5) - 10(4, 6)	*AA*	6	1.0
263275.38(21)		10(5, 6) - 10(4, 7)	*EA*	4	0.78
263280.45(15)		10(5, 6) - 10(4, 7)	*AE*	6	1.0
263280.81(13)		10(5, 6) - 10(4, 7)	*EE*	16	0.68
263287.36(19)		10(5, 6) - 10(4, 7)	*AA*	10	1.0
263400.66(15)		9(5, 4) - 9(4, 5)	*AE*	6	1.0
263403.55(17)		9(5, 4) - 9(4, 5)	*EA*	4	0.92
263406.63(6)		9(5, 4) - 9(4, 5)	*EE*	16	0.81
263407.79(16)		9(5, 4) - 9(4, 5)	*AA*	10	1.0
263410.63(13)		9(5, 5) - 9(4, 6)	*EA*	2	0.92
263413.52(15)		9(5, 5) - 9(4, 6)	*AE*	4	1.0
263414.68(9)		9(5, 5) - 9(4, 6)	*EE*	16	0.81
263420.65(16)		9(5, 5) - 9(4, 6)	*AA*	6	1.0
263506.78(12)		8(5, 3) - 8(4, 4)	*AE*	4	1.0
263507.33(17)		8(5, 3) - 8(4, 4)	*EA*	2	0.99
263511.22(8)		8(5, 4) - 8(4, 5)	*EA*	4	0.99
263511.48(7)		8(5, 3) - 8(4, 4)	*EE*	16	0.95
263511.75(12)		8(5, 4) - 8(4, 5)	*AE*	6	1.0
263514.00(13)		8(5, 3) - 8(4, 4)	*AA*	6	1.0
263514.28(4)		8(5, 4) - 8(4, 5)	*EE*	16	0.95
263518.97(13)		8(5, 4) - 8(4, 5)	*AA*	10	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
263578.32(16)		7(5, 2) - 7(4, 3)	*EA*	4	0.00
263579.19(11)		7(5, 2) - 7(4, 3)	*AE*	6	1.0
263580.86(11)		7(5, 3) - 7(4, 4)	*AE*	4	1.0
263581.73(7)		7(5, 3) - 7(4, 4)	*EA*	2	0.00
263582.79(8)		7(5, 2) - 7(4, 3)	*EE*	16	0.00
263584.61(3)		7(5, 3) - 7(4, 4)	*EE*	16	0.00
263586.55(12)		7(5, 2) - 7(4, 3)	*AA*	10	1.0
263588.22(12)		7(5, 3) - 7(4, 4)	*AA*	6	1.0
263624.87(14)		6(5, 1) - 6(4, 2)	*EA*	2	0.00
263626.34(10)		6(5, 1) - 6(4, 2)	*AE*	4	1.0
263626.80(10)		6(5, 2) - 6(4, 3)	*AE*	6	1.0
263628.26(8)		6(5, 2) - 6(4, 3)	*EA*	4	0.00
263629.45(7)		6(5, 1) - 6(4, 2)	*EE*	16	0.00
263631.15(4)		6(5, 2) - 6(4, 3)	*EE*	16	0.00
263633.81(11)		6(5, 1) - 6(4, 2)	*AA*	6	1.0
263634.27(11)		6(5, 2) - 6(4, 3)	*AA*	10	1.0
263653.33(14)		5(5, 0) - 5(4, 1)	*EA*	4	1.0
263655.01(9)		5(5, 0) - 5(4, 1)	*AE*	6	1.0
263655.10(9)		5(5, 1) - 5(4, 2)	*AE*	4	1.0
263656.77(9)		5(5, 1) - 5(4, 2)	*EA*	2	1.0
263657.98(6)		5(5, 0) - 5(4, 1)	*EE*	16	1.0
263659.70(4)		5(5, 1) - 5(4, 2)	*EE*	16	1.0
263662.59(11)		5(5, 0) - 5(4, 1)	*AA*	10	1.0
263662.68(11)		5(5, 1) - 5(4, 2)	*AA*	6	1.0
265150.90(16)		11(2,10) - 10(1, 9)	*AE*	4	1.0
265150.90(16)		11(2,10) - 10(1, 9)	*EA*	2	1.0
265152.75(8)		11(2,10) - 10(1, 9)	*EE*	16	1.0
265154.59(19)		11(2,10) - 10(1, 9)	*AA*	6	1.0
268454.40(14)		8(8, 1) - 9(7, 2)	*EA*	4	1.0
268456.50(7)		8(8, 1) - 9(7, 2)	*EE*	16	1.0
268458.59(61)		8(8, 1) - 9(7, 2)	*AA*	10	1.0
268458.59(61)		8(8, 0) - 9(7, 3)	*AA*	6	1.0
268459.03(10)		8(8, 0) - 9(7, 3)	*AE*	4	1.0
268459.03(10)		8(8, 1) - 9(7, 2)	*AE*	6	1.0
268461.12(8)		8(8, 0) - 9(7, 3)	*EE*	16	1.0
268463.65(17)		8(8, 0) - 9(7, 3)	*EA*	2	1.0
269608.70(4)		15(0,15) - 14(1,14)	*AE*	6	1.0
269608.70(4)		15(0,15) - 14(1,14)	*EA*	4	1.0
269608.71(2)		15(0,15) - 14(1,14)	*EE*	16	1.0
269608.73(21)		15(0,15) - 14(1,14)	*AA*	10	1.0
269887.18(9)		11(9, 3) - 12(8, 4)	*EA*	2	0.00
269890.86(4)		11(9, 3) - 12(8, 4)	*EE*	16	0.00
269894.55(91)		11(9, 3) - 12(8, 4)	*AA*	6	1.0
269894.55(91)		11(9, 2) - 12(8, 5)	*AA*	10	1.0
269898.05(18)		11(9, 3) - 12(8, 4)	*AE*	4	1.0
269898.05(18)		11(9, 2) - 12(8, 5)	*AE*	6	1.0
269901.74(22)		11(9, 2) - 12(8, 5)	*EE*	16	0.00
269908.93(45)		11(9, 2) - 12(8, 5)	*EA*	4	0.00
271246.16(24)		14(10, 5) - 15(9, 6)	*EA*	4	1.0
271251.34(11)		14(10, 5) - 15(9, 6)	*EE*	16	1.0
271256.47(129)		14(10, 4) - 15(9, 7)	*AA*	6	1.0
271256.47(129)		14(10, 5) - 15(9, 6)	*AA*	10	1.0
271261.84(22)		14(10, 5) - 15(9, 6)	*AE*	6	1.0
271261.84(22)		14(10, 4) - 15(9, 7)	*AE*	4	1.0
271266.97(33)		14(10, 4) - 15(9, 7)	*EE*	16	1.0
271277.53(68)		14(10, 4) - 15(9, 7)	*EA*	2	1.0
275381.59(2)		15(1,15) - 14(0,14)	*AE*	4	1.0
275381.59(2)		15(1,15) - 14(0,14)	*EA*	2	1.0
275381.82(1)		15(1,15) - 14(0,14)	*EE*	16	1.0
275382.06(23)		15(1,15) - 14(0,14)	*AA*	6	1.0
277644.40(15)		7(3, 5) - 6(2, 4)	*EA*	2	1.0
277645.16(13)		7(3, 5) - 6(2, 4)	*AE*	4	1.0
277648.50(7)		7(3, 5) - 6(2, 4)	*EE*	16	1.0
277652.21(12)		7(3, 5) - 6(2, 4)	*AA*	6	1.0

TABLE 7. Microwave transitions of $^{12}CH_3$ ^{16}O $^{12}CH_3$ in order of increasing frequency—Continued

Calculated frequency (MHz)	Measured frequency (MHz)	Transition	Sym.	Spin wt.	Rel. int.
278405.40(18)		12(2,11) - 11(1,10)	AE	6	1.0
278405.40(18)		12(2,11) - 11(1,10)	EA	4	1.0
278407.11(9)		12(2,11) - 11(1,10)	EE	16	1.0
278408.81(23)		12(2,11) - 11(1,10)	AA	10	1.0
280185.26(12)		7(3, 4) - 6(2, 5)	AE	6	1.0
280186.02(9)		7(3, 4) - 6(2, 5)	EA	4	1.0
280188.98(5)		7(3, 4) - 6(2, 5)	EE	16	1.0
280192.32(11)		7(3, 4) - 6(2, 5)	AA	10	1.0
280914.04(38)		4(4, 1) - 3(3, 0)	EA	4	0.00
280928.76(19)		4(4, 1) - 3(3, 0)	EE	16	0.00
280934.98(11)		4(4, 1) - 3(3, 0)	AE	6	1.0
280935.66(11)		4(4, 0) - 3(3, 1)	AE	4	1.0
280943.18(10)		4(4, 1) - 3(3, 0)	AA	10	1.0
280943.85(10)		4(4, 0) - 3(3, 1)	AA	6	1.0
280950.08(8)		4(4, 0) - 3(3, 1)	EE	16	0.00
280956.61(16)		4(4, 0) - 3(3, 1)	EA	2	0.00
288877.57(10)		10(9, 2) - 11(8, 3)	EA	4	1.0
288881.32(5)		10(9, 2) - 11(8, 3)	EE	16	1.0
288885.07(91)		10(9, 2) - 11(8, 3)	AA	10	1.0
288885.07(91)		10(9, 1) - 11(8, 4)	AA	6	1.0
288888.70(16)		10(9, 2) - 11(8, 3)	AE	6	1.0
288888.70(16)		10(9, 1) - 11(8, 4)	AE	4	1.0
288892.45(20)		10(9, 1) - 11(8, 4)	EE	16	1.0
288899.82(42)		10(9, 1) - 11(8, 4)	EA	2	1.0
290071.30(18)		9(2, 7) - 8(1, 8)	AE	6	1.0
290071.31(18)		9(2, 7) - 8(1, 8)	EA	4	1.0
290074.13(9)		9(2, 7) - 8(1, 8)	EE	16	1.0
290076.96(12)		9(2, 7) - 8(1, 8)	AA	10	1.0
290245.67(19)		13(10, 4) - 14(9, 5)	EA	2	0.00
290250.92(10)		13(10, 4) - 14(9, 5)	EE	16	0.00
290256.17(130)		13(10, 3) - 14(9, 6)	AA	10	1.0
290256.17(130)		13(10, 4) - 14(9, 5)	AA	6	1.0
290261.92(24)		13(10, 4) - 14(9, 5)	AE	4	1.0
290261.92(24)		13(10, 3) - 14(9, 6)	AE	6	1.0
290267.17(34)		13(10, 3) - 14(9, 6)	EE	16	0.00
290278.17(68)		13(10, 3) - 14(9, 6)	EA	4	0.00
291441.52(19)		13(2,12) - 12(1,11)	AE	4	1.0
291441.52(19)		13(2,12) - 12(1,11)	EA	2	1.0
291443.09(9)		13(2,12) - 12(1,11)	EE	16	1.0
291444.67(28)		13(2,12) - 12(1,11)	AA	6	1.0
295334.81(16)		8(3, 6) - 7(2, 5)	EA	4	1.0
295335.15(15)		8(3, 6) - 7(2, 5)	AE	6	1.0
295338.55(7)		8(3, 6) - 7(2, 5)	EE	16	1.0
295342.10(14)		8(3, 6) - 7(2, 5)	AA	10	1.0
299865.31(40)		5(4, 2) - 4(3, 1)	EA	2	0.01
299879.67(19)		5(4, 2) - 4(3, 1)	EE	16	0.04
299884.29(11)		5(4, 2) - 4(3, 1)	AE	4	1.0
299888.96(11)		5(4, 1) - 4(3, 2)	AE	6	1.0
299892.40(11)		5(4, 2) - 4(3, 1)	AA	6	1.0
299897.07(11)		5(4, 1) - 4(3, 2)	AA	10	1.0
299899.69(12)		8(3, 5) - 7(2, 6)	AE	4	1.0
299900.02(10)		8(3, 5) - 7(2, 6)	EA	2	1.0
299901.70(7)		5(4, 1) - 4(3, 2)	EE	16	0.04
299903.24(5)		8(3, 5) - 7(2, 6)	EE	16	1.0
299906.64(13)		8(3, 5) - 7(2, 6)	AA	6	1.0
299907.95(17)		5(4, 1) - 4(3, 2)	EA	4	0.01

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