

# L.

H = 0 km

## Statistics Summary:

|                          |                 |  |            |                      |            |
|--------------------------|-----------------|--|------------|----------------------|------------|
| T                        | [°C]            |  | 6.70(24)   | 29.70(35)            | 52.40(08)  |
| P                        | [torr]<br>[kPa] |  | 759.80(19) | 759.90(21)<br>101.30 | 759.70(35) |
| $\sigma_x(\Delta\alpha)$ | [dB/km]         |  | 0.314      | 0.381                | 0.434      |

H = 0.0 km

| 6.7°C       |                             | 29.7°C      |                             | 52.4°C      |                             |
|-------------|-----------------------------|-------------|-----------------------------|-------------|-----------------------------|
| $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    |
| P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ |
| dB/km       |                             | dB/km       |                             | dB/km       |                             |
| 53.88093    | 1.94(.03)                   | 53.88202    | 1.71(.03)                   | 53.88298    | 1.57(.03)                   |
| 759.9       | 2.05( 0.11)                 | 760.0       | 1.84( 0.13)                 | 759.8       | 1.69( 0.12)                 |
| 53.97964    | 2.21(.02)                   | 53.98071    | 1.73(.02)                   | 53.98169    | 1.85(.03)                   |
| 759.8       | 2.18(-0.03)                 | 759.8       | 1.97( 0.24)                 | 759.3       | 1.80(-0.05)                 |
| 54.07821    | 2.44(.02)                   | 54.07935    | 2.09(.02)                   | 54.08023    | 2.11(.03)                   |
| 759.9       | 2.33(-0.11)                 | 759.8       | 2.10( 0.01)                 | 760.1       | 1.93(-0.18)                 |
| 54.17692    | 2.56(.03)                   | 54.17826    | 2.12(.03)                   | 54.17894    | 1.81(.03)                   |
| 759.9       | 2.48(-0.08)                 | 759.8       | 2.24( 0.12)                 | 759.9       | 2.06( 0.25)                 |
| 54.27554    | 2.48(.02)                   | 54.27660    | 2.39(.03)                   | 54.27756    | 2.42(.04)                   |
| 759.6       | 2.64( 0.16)                 | 759.6       | 2.39( 0.00)                 | 760.0       | 2.19(-0.23)                 |
| 54.37293    | 2.74(.02)                   | 54.37414    | 2.55(.03)                   | 54.37623    | 2.50(.03)                   |
| 759.6       | 2.82( 0.08)                 | 759.6       | 2.55( 0.00)                 | 759.6       | 2.34(-0.16)                 |
| 54.41448    | 3.43(.03)                   | 54.41647    | 2.77(.03)                   | 54.41839    | 2.13(.04)                   |
| 759.6       | 2.89(-0.54)                 | 759.8       | 2.62(-0.15)                 | 759.6       | 2.40( 0.27)                 |
| 54.51556    | 3.39(.03)                   | 54.51771    | 3.09(.02)                   | 54.51865    | 2.81(.03)                   |
| 759.8       | 3.08(-0.31)                 | 760.0       | 2.79(-0.30)                 | 759.2       | 2.56(-0.25)                 |
| 54.61648    | 3.09(.03)                   | 54.61759    | 3.19(.03)                   | 54.61858    | 2.48(.04)                   |
| 759.9       | 3.28( 0.19)                 | 760.0       | 2.97(-0.22)                 | 759.8       | 2.72( 0.24)                 |
| 54.71655    | 3.48(.02)                   | 54.71764    | 2.92(.03)                   | 54.71864    | 2.91(.04)                   |
| 759.7       | 3.49( 0.01)                 | 759.9       | 3.16( 0.24)                 | 760.4       | 2.90(-0.01)                 |
| 54.81646    | 3.60(.04)                   | 54.81762    | 3.47(.03)                   | 54.81853    | 3.06(.04)                   |
| 760.0       | 3.72( 0.12)                 | 759.8       | 3.36(-0.11)                 | 760.1       | 3.07( 0.01)                 |
| 54.91653    | 3.78(.04)                   | 54.91789    | 3.39(.04)                   | 54.91857    | 3.67(.05)                   |
| 760.0       | 3.95( 0.17)                 | 759.8       | 3.57( 0.18)                 | 759.9       | 3.26(-0.41)                 |
| 55.01651    | 4.00(.04)                   | 55.01757    | 3.94(.05)                   | 55.01855    | 3.42(.05)                   |
| 759.6       | 4.19( 0.19)                 | 759.6       | 3.78(-0.16)                 | 760.0       | 3.45( 0.03)                 |
| 55.11522    | 5.25(.04)                   | 55.11645    | 3.97(.04)                   | 55.11858    | 3.49(.04)                   |
| 759.5       | 4.44(-0.81)                 | 759.6       | 4.01( 0.04)                 | 759.5       | 3.65( 0.16)                 |
| 55.14732    | 4.78(.04)                   | 55.14934    | 3.97(.04)                   | 55.15129    | 3.94(.06)                   |
| 759.4       | 4.53(-0.25)                 | 759.7       | 4.08( 0.11)                 | 759.6       | 3.72(-0.22)                 |
| 55.24976    | 4.91(.05)                   | 55.25194    | 4.67(.04)                   | 55.25290    | 4.26(.04)                   |
| 759.8       | 4.80(-0.11)                 | 760.0       | 4.32(-0.35)                 | 758.9       | 3.94(-0.32)                 |
| 55.35204    | 4.94(.04)                   | 55.35317    | 5.15(.04)                   | 55.35417    | 4.23(.06)                   |
| 759.9       | 5.08( 0.14)                 | 760.0       | 4.57(-0.58)                 | 759.7       | 4.15(-0.08)                 |
| 55.45346    | 5.49(.04)                   | 55.45457    | 4.74(.04)                   | 55.45559    | 4.62(.05)                   |
| 760.1       | 5.37(-0.12)                 | 759.8       | 4.83( 0.09)                 | 759.9       | 4.38(-0.24)                 |
| 55.55473    | 6.03(.04)                   | 55.55591    | 5.20(.04)                   | 55.55682    | 4.75(.05)                   |
| 760.0       | 5.68(-0.35)                 | 759.8       | 5.09(-0.11)                 | 760.1       | 4.61(-0.14)                 |

H = 0.0 km

| 6.7°C       |                             | 29.7°C      |                             | 52.4°C      |                             |
|-------------|-----------------------------|-------------|-----------------------------|-------------|-----------------------------|
| $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    |
| P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ |
| dB/km       |                             | dB/km       |                             | dB/km       |                             |
| 55.65614    | 6.08(.05)                   | 55.65752    | 5.25(.05)                   | 55.65822    | 5.27(.05)                   |
| 760.0       | 5.99(-0.09)                 | 759.7       | 5.36( 0.11)                 | 759.9       | 4.85(-0.42)                 |
| 55.75747    | 6.36(.05)                   | 55.75855    | 6.17(.05)                   | 55.75955    | 4.97(.04)                   |
| 759.6       | 6.30(-0.06)                 | 759.7       | 5.64(-0.53)                 | 760.0       | 5.09( 0.12)                 |
| 55.85752    | 7.21(.05)                   | 55.85865    | 6.12(.04)                   | 55.86092    | 5.23(.05)                   |
| 759.5       | 6.62(-0.59)                 | 759.7       | 5.91(-0.21)                 | 759.5       | 5.33( 0.10)                 |
| 55.88015    | 7.25(.06)                   | 55.88221    | 6.32(.04)                   | 55.88417    | 5.71(.05)                   |
| 759.5       | 6.70(-0.55)                 | 759.8       | 5.98(-0.34)                 | 759.6       | 5.39(-0.32)                 |
| 55.98396    | 7.11(.04)                   | 55.98617    | 6.57(.03)                   | 55.98714    | 5.71(.06)                   |
| 759.8       | 7.04(-0.07)                 | 760.0       | 6.27(-0.30)                 | 759.0       | 5.64(-0.07)                 |
| 56.08761    | 7.59(.05)                   | 56.08874    | 7.20(.05)                   | 56.08977    | 6.12(.05)                   |
| 759.9       | 7.38(-0.21)                 | 760.1       | 6.56(-0.64)                 | 759.8       | 5.89(-0.23)                 |
| 56.19037    | 8.29(.04)                   | 56.19151    | 7.05(.06)                   | 56.19252    | 6.22(.07)                   |
| 759.8       | 7.72(-0.57)                 | 759.9       | 6.86(-0.19)                 | 759.0       | 6.14(-0.08)                 |
| 56.29298    | 8.28(.05)                   | 56.29418    | 7.30(.05)                   | 56.29511    | 6.48(.05)                   |
| 760.0       | 8.07(-0.21)                 | 759.8       | 7.15(-0.15)                 | 760.0       | 6.39(-0.09)                 |
| 56.39576    | 8.58(.07)                   | 56.39716    | 7.92(.06)                   | 56.39787    | 6.55(.05)                   |
| 760.0       | 8.42(-0.16)                 | 759.8       | 7.45(-0.47)                 | 759.9       | 6.64( 0.09)                 |
| 56.49843    | 8.74(.07)                   | 56.49954    | 8.03(.06)                   | 56.50054    | 6.89(.06)                   |
| 759.6       | 8.76( 0.02)                 | 759.6       | 7.74(-0.29)                 | 760.0       | 6.88(-0.01)                 |
| 56.61300    | 9.47(.05)                   | 56.61507    | 8.63(.05)                   | 56.61707    | 7.17(.07)                   |
| 759.7       | 9.15(-0.32)                 | 759.7       | 8.06(-0.57)                 | 759.6       | 7.15(-0.02)                 |
| 56.71817    | 9.84(.06)                   | 56.72041    | 8.51(.06)                   | 56.72140    | 7.54(.06)                   |
| 759.8       | 9.50(-0.34)                 | 759.9       | 8.35(-0.16)                 | 758.9       | 7.39(-0.15)                 |
| 56.82318    | 9.64(.07)                   | 56.82434    | 9.07(.06)                   | 56.82534    | 7.71(.09)                   |
| 759.9       | 9.84( 0.20)                 | 760.0       | 8.63(-0.44)                 | 759.8       | 7.62(-0.09)                 |
| 56.92730    | 10.25(.09)                  | 56.92844    | 8.33(.05)                   | 56.92947    | 7.76(.08)                   |
| 760.1       | 10.18(-0.07)                | 759.9       | 8.90( 0.57)                 | 759.0       | 7.85( 0.09)                 |
| 57.03127    | 10.80(.08)                  | 57.03248    | 9.16(.08)                   | 57.03342    | 8.27(.06)                   |
| 760.0       | 10.51(-0.29)                | 759.8       | 9.17( 0.01)                 | 760.1       | 8.07(-0.20)                 |
| 57.13538    | 10.62(.08)                  | 57.13681    | 9.59(.06)                   | 57.13750    | 8.22(.06)                   |
| 760.0       | 10.83( 0.21)                | 759.8       | 9.43(-0.16)                 | 759.9       | 8.28( 0.06)                 |
| 57.23942    | 11.08(.08)                  | 57.24053    | 9.84(.09)                   | 57.24155    | 8.06(.05)                   |
| 759.6       | 11.15( 0.07)                | 759.6       | 9.69(-0.15)                 | 760.0       | 8.48( 0.42)                 |
| 57.34585    | 11.85(.09)                  | 57.34341    | 9.79(.06)                   | 57.34998    | 8.57(.07)                   |
| 759.6       | 11.46(-0.39)                | 759.6       | 9.93( 0.14)                 | 759.6       | 8.69( 0.12)                 |
| 57.45239    | 11.55(.08)                  | 57.45467    | 10.13(.08)                  | 57.45567    | 8.56(.12)                   |
| 759.8       | 11.77( 0.22)                | 760.0       | 10.18( 0.05)                | 760.2       | 8.88( 0.32)                 |

H = 0.0 km

| 6.7°C       |                             | 29.7°C      |                             | 52.4°C      |                             |
|-------------|-----------------------------|-------------|-----------------------------|-------------|-----------------------------|
| $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    |
| P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ |
| dB/km       |                             | dB/km       |                             | dB/km       |                             |
| 57.55877    | 12.08(.09)                  | 57.55994    | 10.60(.09)                  | 57.56098    | 9.32(.11)                   |
| 759.9       | 12.06(-0.02)                | 760.0       | 10.41(-0.19)                | 759.7       | 9.06(-0.26)                 |
| 57.66424    | 12.77(.09)                  | 57.66541    | 9.94(.07)                   | 57.66647    | 8.83(.10)                   |
| 759.8       | 12.35(-0.42)                | 759.9       | 10.63( 0.69)                | 759.2       | 9.24( 0.41)                 |
| 57.76955    | 13.26(.13)                  | 57.77079    | 10.84(.11)                  | 57.77175    | 8.40(.09)                   |
| 760.0       | 12.62(-0.64)                | 759.8       | 10.85( 0.01)                | 760.1       | 9.41( 1.01)                 |
| 57.87504    | 13.16(.10)                  | 57.87648    | 10.97(.08)                  | 57.87725    | 9.65(.08)                   |
| 760.0       | 12.89(-0.27)                | 759.7       | 11.06( 0.09)                | 759.9       | 9.57(-0.08)                 |
| 57.98043    | 13.29(.08)                  | 57.98155    | 11.12(.07)                  | 57.98259    | 9.33(.07)                   |
| 759.6       | 13.14(-0.15)                | 759.6       | 11.26( 0.14)                | 760.0       | 9.72( 0.39)                 |
| 58.08361    | 13.49(.05)                  | 58.08086    | 11.49(.06)                  | 58.08671    | 9.32(.06)                   |
| 760.3       | 13.39(-0.10)                | 759.7       | 11.44(-0.05)                | 760.1       | 9.87( 0.55)                 |
| 58.17257    | 13.61(.08)                  | 58.18893    | 11.51(.09)                  | 58.17680    | 9.77(.04)                   |
| 759.8       | 13.59(-0.02)                | 759.9       | 11.62( 0.11)                | 760.0       | 9.99( 0.22)                 |
| 58.27888    | 13.63(.08)                  | 58.29556    | 11.47(.07)                  | 58.29659    | 9.54(.09)                   |
| 759.8       | 13.81( 0.18)                | 760.0       | 11.80( 0.33)                | 759.8       | 10.15( 0.61)                |
| 58.36207    | 13.95(.06)                  | 58.36390    | 11.48(.04)                  | 58.36509    | 9.82(.05)                   |
| 760.1       | 13.98( 0.03)                | 759.9       | 11.90( 0.42)                | 759.8       | 10.23( 0.41)                |
| 58.40118    | 14.17(.07)                  | 58.40234    | 11.47(.07)                  | 58.40340    | 9.67(.07)                   |
| 759.8       | 14.06(-0.11)                | 759.9       | 11.96( 0.49)                | 759.3       | 10.27( 0.60)                |
| 58.45518    | 14.03(.06)                  | 58.45667    | 11.44(.06)                  | 58.45789    | 9.70(.04)                   |
| 759.9       | 14.16( 0.13)                | 759.7       | 12.04( 0.60)                | 760.0       | 10.33( 0.63)                |
| 58.50784    | 13.70(.07)                  | 58.50908    | 11.88(.06)                  | 58.51006    | 9.62(.07)                   |
| 760.0       | 14.26( 0.56)                | 759.8       | 12.11( 0.23)                | 760.1       | 10.38( 0.76)                |
| 58.54771    | 14.13(.05)                  | 58.54914    | 11.80(.03)                  | 58.55060    | 9.42(.03)                   |
| 759.6       | 14.33( 0.20)                | 759.7       | 12.16( 0.36)                | 760.1       | 10.42( 1.00)                |
| 58.61466    | 14.24(.05)                  | 58.61611    | 11.76(.06)                  | 58.61686    | 9.80(.05)                   |
| 760.0       | 14.45( 0.21)                | 759.8       | 12.25( 0.49)                | 759.9       | 10.49( 0.69)                |
| 58.72138    | 14.45(.09)                  | 58.72252    | 11.19(.06)                  | 58.72356    | 9.81(.05)                   |
| 759.6       | 14.62( 0.17)                | 759.6       | 12.38( 1.19)                | 760.0       | 10.58( 0.77)                |
| 58.82675    | 14.68(.06)                  | 58.82807    | 12.09(.04)                  | 58.81578    | 9.83(.06)                   |
| 759.6       | 14.79( 0.11)                | 759.6       | 12.50( 0.41)                | 759.6       | 10.66( 0.83)                |
| 58.90662    | 14.71(.05)                  | 58.90988    | 12.25(.03)                  |             |                             |
| 759.7       | 14.90( 0.19)                | 760.2       | 12.59( 0.34)                |             |                             |
| 59.01428    | 14.32(.05)                  | 59.01564    | 12.20(.03)                  | 59.03218    | 10.27(.07)                  |
| 759.8       | 15.06( 0.74)                | 760.1       | 12.70( 0.50)                | 759.8       | 10.83( 0.56)                |
| 59.09850    | 14.09(.04)                  | 59.13926    | 12.39(.05)                  | 59.14034    | 9.95(.05)                   |
| 760.1       | 15.17( 1.08)                | 759.9       | 12.83( 0.44)                | 759.6       | 10.91( 0.96)                |

H = 0.0 km

| 6.7°C                            |   | 29.7°C                           |   | 52.4°C                           |   |
|----------------------------------|---|----------------------------------|---|----------------------------------|---|
| f <sub>x</sub> [GHz]<br>P [torr] | α <sub>x</sub> (δα)<br>α <sub>M</sub> (±Δα) | f <sub>x</sub> [GHz]<br>P [torr] | α <sub>x</sub> (δα)<br>α <sub>M</sub> (±Δα) | f <sub>x</sub> [GHz]<br>P [torr] | α <sub>x</sub> (δα)<br>α <sub>M</sub> (±Δα) |
| dB/km                            |   | dB/km                            |   | dB/km                            |   |
| 59.19279<br>760.1                | 14.81(.04)<br>15.30( 0.49)                  | 59.19428<br>759.6                | 12.39(.04)<br>12.88( 0.49)                  | 59.19554<br>759.8                | 10.64(.03)<br>10.96( 0.32)                  |
| 59.24607<br>760.0                | 15.04(.08)<br>15.37( 0.33)                  | 59.24733<br>759.8                | 11.93(.05)<br>12.94( 1.01)                  | 59.24831<br>760.1                | 9.98(.06)<br>11.00( 1.02)                   |
| 59.28649<br>759.5                | 15.19(.05)<br>15.42( 0.23)                  | 59.28794<br>759.6                | 12.29(.02)<br>12.98( 0.69)                  | 59.28941<br>760.0                | 10.05(.03)<br>11.03( 0.98)                  |
| 59.35426<br>760.0                | 15.04(.06)<br>15.51( 0.47)                  | 59.35574<br>759.8                | 12.18(.05)<br>13.05( 0.87)                  | 59.35646<br>759.9                | 10.29(.06)<br>11.09( 0.80)                  |
| 59.38229<br>759.9                | 15.08(.04)<br>15.55( 0.47)                  | 59.38350<br>759.7                | 12.89(.02)<br>13.08( 0.19)                  | 59.38516<br>759.9                | 10.12(.02)<br>11.11( 0.99)                  |
| 59.46232<br>759.6                | 15.25(.06)<br>15.65( 0.40)                  | 59.46347<br>759.6                | 12.15(.05)<br>13.16( 1.01)                  | 59.46453<br>760.0                | 10.42(.06)<br>11.18( 0.76)                  |
| 59.54941<br>760.3                | 15.63(.04)<br>15.77( 0.14)                  | 59.55196<br>760.2                | 12.58(.01)<br>13.26( 0.68)                  | 59.55260<br>760.0                | 10.33(.02)<br>11.26( 0.93)                  |
| 59.56902<br>759.7                | 15.81(.06)<br>15.79(-0.02)                  | 59.57023<br>759.9                | 12.46(.05)<br>13.28( 0.82)                  | 59.57264<br>759.5                | 10.39(.05)<br>11.27( 0.88)                  |
| 59.64063<br>759.7                | 15.01(.04)<br>15.88( 0.87)                  | 59.65734<br>759.9                | 12.45(.06)<br>13.37( 0.92)                  | 59.65836<br>759.3                | 10.47(.08)<br>11.35( 0.88)                  |
| 59.74966<br>759.8                | 15.99(.04)<br>16.02( 0.03)                  | 59.75102<br>760.3                | 13.11(.03)<br>13.47( 0.36)                  | 59.75228<br>759.9                | 11.02(.02)<br>11.44( 0.42)                  |
| 59.83492<br>760.2                | 15.60(.03)<br>16.12( 0.52)                  | 59.83680<br>760.1                | 13.11(.02)<br>13.56( 0.45)                  | 59.83804<br>759.8                | 10.42(.03)<br>11.52( 1.10)                  |
| 59.93040<br>760.1                | 16.03(.03)<br>16.23( 0.20)                  | 59.93192<br>759.5                | 12.78(.02)<br>13.66( 0.88)                  | 59.93318<br>759.8                | 10.74(.02)<br>11.61( 0.87)                  |
| 60.02528<br>759.5                | 16.08(.03)<br>16.33( 0.25)                  | 60.02674<br>759.6                | 13.04(.02)<br>13.75( 0.71)                  | 60.02822<br>760.1                | 10.66(.02)<br>11.69( 1.03)                  |
| 60.12228<br>759.8                | 16.32(.04)<br>16.42( 0.10)                  | 60.12349<br>759.7                | 12.80(.02)<br>13.83( 1.03)                  | 60.12517<br>759.9                | 11.07(.02)<br>11.77( 0.70)                  |
| 60.20327<br>759.7                | 15.46(.17)<br>16.48( 1.02)                  |                                  |   | 60.20550<br>760.0                | 10.22(.15)<br>11.83( 1.61)                  |
| 60.28234<br>760.2                | 16.21(.03)<br>13.95( 0.53)                  | 60.28491<br>760.2                | 13.42(.02)<br>16.54( 0.33)                  | 60.28556<br>760.0                | 11.21(.02)<br>11.88( 0.67)                  |
| 60.31134<br>759.5                | 16.54(.17)<br>16.55( 0.01)                  | 60.31267<br>759.6                | 13.44(.15)<br>13.96( 0.52)                  | 60.31501<br>759.5                | 10.91(.15)<br>11.90( 0.99)                  |
| 60.37468<br>759.7                | 16.26(.03)<br>16.59( 0.33)                  | 60.37803<br>760.3                | 13.16(.02)<br>14.00( 0.84)                  | 60.37907<br>760.1                | 10.85(.01)<br>11.93( 1.08)                  |
| 60.48505<br>759.8                | 16.48(.02)<br>16.62( 0.14)                  | 60.48644<br>760.4                | 13.41(.02)<br>14.04( 0.63)                  | 60.48771<br>759.9                | 11.15(.02)<br>11.98( 0.83)                  |

H = 0.0 km

| 6.7°C                |                      | 29.7°C               |                      | 52.4°C               |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| f <sub>x</sub> [GHz] | α <sub>x</sub> (δα)  | f <sub>x</sub> [GHz] | α <sub>x</sub> (δα)  | f <sub>x</sub> [GHz] | α <sub>x</sub> (δα)  |
| P [torr]             | α <sub>M</sub> (±Δα) | P [torr]             | α <sub>M</sub> (±Δα) | P [torr]             | α <sub>M</sub> (±Δα) |
| dB/km                |                      | dB/km                |                      | dB/km                |                      |
| 60.57137             | 16.53(.03)           | 60.57326             | 13.48(.01)           | 60.57450             | 10.72(.02)           |
| 760.3                | 16.63( 0.10)         | 760.2                | 14.06( 0.58)         | 759.7                | 12.00( 1.28)         |
| 60.66801             | 16.31(.03)           | 60.66955             | 13.71(.02)           | 60.67083             | 11.25(.01)           |
| 760.2                | 16.63( 0.32)         | 759.5                | 14.06( 0.35)         | 759.8                | 12.01( 0.76)         |
| 60.76407             | 16.36(.03)           | 60.76554             | 13.31(.01)           | 60.76704             | 10.96(.01)           |
| 759.4                | 16.61( 0.25)         | 759.6                | 14.06( 0.75)         | 760.0                | 12.02( 1.06)         |
| 60.86226             | 16.30(.02)           | 60.86348             | 13.41(.01)           | 60.86518             | 11.16(.01)           |
| 759.7                | 16.57( 0.27)         | 759.7                | 14.04( 0.63)         | 759.9                | 12.01( 0.85)         |
| 61.01526             | 16.09(.02)           | 61.01787             | 13.54(.02)           | 61.01852             | 11.42(.01)           |
| 760.1                | 16.47( 0.38)         | 760.4                | 13.98( 0.44)         | 760.0                | 11.98( 0.56)         |
| 61.10872             | 16.46(.05)           | 61.11213             | 13.64(.03)           | 61.11312             | 11.46(.03)           |
| 759.8                | 16.40(-0.06)         | 759.9                | 13.93( 0.29)         | 760.1                | 11.95( 0.49)         |
| 61.22038             | 16.31(.04)           | 61.22184             | 13.67(.02)           | 61.22312             | 11.42(.02)           |
| 759.9                | 16.29(-0.02)         | 759.9                | 13.86( 0.19)         | 760.1                | 11.91( 0.49)         |
| 61.30779             | 16.54(.04)           | 61.30973             | 13.28(.01)           | 61.31095             | 11.44(.02)           |
| 760.0                | 16.19(-0.35)         | 760.2                | 13.80( 0.52)         | 760.0                | 11.86( 0.42)         |
| 61.40565             | 16.20(.03)           | 61.40717             | 13.16(.02)           | 61.40846             | 11.25(.02)           |
| 759.7                | 16.07(-0.13)         | 759.8                | 13.71( 0.55)         | 760.0                | 11.81( 0.56)         |
| 61.50285             | 15.84(.01)           | 61.50434             | 13.16(.03)           | 61.50582             | 11.23(.02)           |
| 759.4                | 15.93( 0.09)         | 759.8                | 13.62( 0.46)         | 760.2                | 11.75( 0.52)         |
| 61.60223             | 15.60(.03)           | 61.60346             | 13.20(.03)           | 61.60519             | 11.33(.02)           |
| 760.0                | 15.77( 0.17)         | 759.8                | 13.51( 0.31)         | 760.1                | 11.67( 0.34)         |
| 61.74821             | 15.65(.02)           | 61.75080             | 13.26(.03)           | 61.75144             | 11.04(.02)           |
| 760.1                | 15.51(-0.14)         | 760.1                | 13.32( 0.06)         | 760.2                | 11.54( 0.50)         |
| 61.84276             | 15.65(.02)           | 61.84620             | 12.75(.02)           | 61.84722             | 11.37(.02)           |
| 759.9                | 15.31(-0.34)         | 760.0                | 13.17( 0.42)         | 760.1                | 11.44( 0.07)         |
| 61.95577             | 15.16(.03)           | 61.95724             | 13.16(.01)           | 61.95854             | 11.20(.01)           |
| 759.9                | 15.05(-0.11)         | 760.0                | 12.98(-0.18)         | 760.0                | 11.30( 0.10)         |
| 62.04422             | 15.22(.02)           | 62.04619             | 13.06(.01)           | 62.04743             | 10.79(.01)           |
| 760.2                | 14.82(-0.40)         | 760.1                | 12.81(-0.25)         | 760.0                | 11.17( 0.38)         |
| 62.14326             | 14.92(.01)           | 62.14481             | 12.32(.01)           | 62.14611             | 10.76(.02)           |
| 759.8                | 14.55(-0.37)         | 759.7                | 12.60( 0.28)         | 760.0                | 11.00( 0.24)         |
| 62.24163             | 14.39(.03)           | 62.24316             | 12.84(.03)           | 62.24465             | 10.60(.01)           |
| 759.6                | 14.25(-0.14)         | 759.7                | 12.36(-0.48)         | 760.2                | 10.82( 0.22)         |
| 62.34222             | 13.80(.02)           | 62.34346             | 11.95(.02)           | 62.34521             | 10.32(.01)           |
| 759.9                | 13.91( 0.11)         | 759.7                | 12.09( 0.14)         | 760.1                | 10.61( 0.29)         |
| 62.48113             | 13.37(.01)           | 62.48374             | 11.74(.02)           | 62.48440             | 10.18(.01)           |
| 760.1                | 13.41( 0.04)         | 760.2                | 11.68(-0.06)         | 760.2                | 10.27( 0.09)         |

H = 0.0 km

| 6.7°C       |                             | 29.7°C      |                             | 52.4°C      |                             |
|-------------|-----------------------------|-------------|-----------------------------|-------------|-----------------------------|
| $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    |
| P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ |
| dB/km       |                             | dB/km       |                             | dB/km       |                             |
| 62.57680    | 13.05(.01)                  | 62.58029    | 11.63(.02)                  | 62.58132    | 9.59(.01)                   |
| 760.1       | 13.04(-0.01)                | 760.1       | 11.37(-0.26)                | 760.1       | 10.02( 0.43)                |
| 62.69115    | 12.82(.02)                  | 62.69265    | 10.48(.01)                  | 62.69397    | 9.54(.01)                   |
| 760.1       | 12.57(-0.25)                | 760.1       | 10.99( 0.51)                | 760.0       | 9.70( 0.16)                 |
| 62.78065    | 12.17(.01)                  | 62.78265    | 10.43(.01)                  | 62.78391    | 9.12(.01)                   |
| 760.3       | 12.19( 0.02)                | 760.1       | 10.67( 0.24)                | 759.9       | 9.43( 0.31)                 |
| 62.88087    | 11.81(.01)                  | 62.88244    | 10.15(.01)                  | 62.88375    | 9.37(.01)                   |
| 759.9       | 11.75(-0.06)                | 759.7       | 10.30( 0.15)                | 760.0       | 9.12(-0.25)                 |
| 62.98042    | 11.45(.01)                  | 62.98195    | 9.79(.01)                   | 62.98347    | 8.73(.01)                   |
| 759.6       | 11.31(-0.14)                | 759.7       | 9.93( 0.14)                 | 760.1       | 8.80( 0.07)                 |
| 63.08220    | 11.02(.01)                  | 63.08346    | 9.43(.01)                   | 63.08522    | 8.58(.01)                   |
| 759.8       | 10.85(-0.17)                | 759.7       | 9.54( 0.11)                 | 760.1       | 8.47(-0.11)                 |
| 63.21404    | 9.95(.01)                   | 63.21669    | 8.90(.01)                   | 63.21735    | 8.00(.01)                   |
| 760.1       | 10.25( 0.30)                | 760.3       | 9.03( 0.13)                 | 760.1       | 8.03( 0.03)                 |
| 63.31083    | 9.49(.01)                   | 63.31436    | 8.52(.01)                   | 63.31541    | 7.99(.01)                   |
| 760.0       | 9.82( 0.33)                 | 760.2       | 8.65( 0.13)                 | 760.0       | 7.71(-0.28)                 |
| 63.42653    | 9.02(.01)                   | 63.42804    | 8.07(.01)                   | 63.42938    | 7.21(.01)                   |
| 760.1       | 9.31( 0.29)                 | 760.2       | 8.22( 0.15)                 | 760.0       | 7.34( 0.13)                 |
| 63.51708    | 8.70(.01)                   | 63.51910    | 7.87(.01)                   | 63.52038    | 6.98(.01)                   |
| 760.6       | 8.91( 0.21)                 | 760.2       | 7.88( 0.01)                 | 759.9       | 7.04( 0.06)                 |
| 63.61848    | 8.47(.01)                   | 63.62008    | 7.29(.01)                   | 63.62140    | 6.58(.01)                   |
| 759.9       | 8.48( 0.01)                 | 759.7       | 7.51( 0.22)                 | 759.9       | 6.73( 0.15)                 |
| 63.71920    | 7.59(.01)                   | 63.72075    | 7.08(.01)                   | 63.72229    | 6.26(.01)                   |
| 759.6       | 8.06( 0.47)                 | 759.7       | 7.15( 0.07)                 | 760.1       | 6.41( 0.15)                 |
| 63.82217    | 7.14(.01)                   | 63.82345    | 6.46(.01)                   | 63.82523    | 6.04(.01)                   |
| 759.8       | 7.64( 0.50)                 | 759.7       | 6.79( 0.33)                 | 760.1       | 6.10( 0.06)                 |
| 63.94695    | 6.67(.02)                   | 63.94962    | 6.27(.01)                   | 63.95030    | 5.65(.01)                   |
| 760.1       | 7.16( 0.49)                 | 760.5       | 6.37( 0.10)                 | 760.2       | 5.74( 0.09)                 |
| 64.04486    | 6.53(.01)                   | 64.04843    | 6.28(.01)                   | 64.04950    | 5.34(.01)                   |
| 760.1       | 6.79( 0.26)                 | 760.3       | 6.04(-0.24)                 | 760.1       | 5.46( 0.12)                 |
| 64.16190    | 6.11(.01)                   | 64.16344    | 5.36(.02)                   | 64.16476    | 5.22(.02)                   |
| 760.2       | 6.37( 0.26)                 | 760.2       | 5.68( 0.32)                 | 760.1       | 5.14(-0.08)                 |
| 64.25349    | 5.79(.01)                   | 64.25555    | 5.16(.01)                   | 64.25682    | 5.04(.01)                   |
| 760.8       | 6.05( 0.26)                 | 760.3       | 5.40( 0.24)                 | 760.1       | 4.89(-0.15)                 |
| 64.35608    | 5.67(.01)                   | 64.35765    | 5.34(.01)                   | 64.35902    | 4.75(.01)                   |
| 760.0       | 5.71( 0.04)                 | 759.8       | 5.11(-0.23)                 | 759.9       | 4.63(-0.12)                 |
| 64.45793    | 5.39(.02)                   | 64.45953    | 5.08(.01)                   | 64.46107    | 4.57(.01)                   |
| 759.7       | 5.38(-0.01)                 | 759.9       | 4.82(-0.26)                 | 760.1       | 4.38(-0.19)                 |

H = 0.0 km

| 6.7°C       |                             | 29.7°C      |                             | 52.4°C      |                             |
|-------------|-----------------------------|-------------|-----------------------------|-------------|-----------------------------|
| $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    | $f_x$ [GHz] | $\alpha_x(\delta\alpha)$    |
| P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ | P [torr]    | $\alpha_M(\pm\Delta\alpha)$ |
| dB/km       |                             | dB/km       |                             | dB/km       |                             |
| 64.56211    | 4.94(.01)                   | 64.56342    | 4.88(.01)                   | 64.56524    | 4.01(.01)                   |
| 759.8       | 5.07( 0.13)                 | 759.7       | 4.54(-0.34)                 | 760.1       | 4.13( 0.12)                 |
| 64.68047    | 4.67(.02)                   | 64.68255    | 4.36(.01)                   | 64.68319    | 4.62(.09)                   |
| 759.6       | 4.73( 0.06)                 | 759.9       | 4.24(-0.12)                 | 760.0       | 3.86(-0.76)                 |
| 64.77893    | 4.17(.01)                   | 64.78252    | 3.98(.01)                   | 64.78352    | 3.75(.01)                   |
| 759.6       | 4.46( 0.29)                 | 759.8       | 3.99( 0.01)                 | 759.9       | 3.64(-0.11)                 |
| 64.89726    | 3.89(.01)                   | 64.89879    | 3.70(.00)                   | 64.90016    | 3.69(.02)                   |
| 760.0       | 4.15( 0.26)                 | 760.0       | 3.72( 0.02)                 | 760.1       | 3.40(-0.29)                 |
| 64.98999    | 3.81(.01)                   | 64.99200    | 3.45(.01)                   | 64.99328    | 3.27(.01)                   |
| 759.6       | 3.92( 0.11)                 | 759.9       | 3.51( 0.06)                 | 760.0       | 3.21(-0.06)                 |
| 65.09367    | 3.45(.00)                   | 65.09527    | 2.98(.01)                   | 65.09666    | 3.16(.01)                   |
| 759.9       | 3.68( 0.23)                 | 759.8       | 3.30( 0.32)                 | 759.9       | 3.01(-0.15)                 |
| 65.19670    | 3.58(.01)                   | 65.19832    | 2.83(.01)                   | 65.19987    | 2.73(.01)                   |
| 759.6       | 3.45(-0.13)                 | 759.8       | 3.09( 0.26)                 | 760.0       | 2.82( 0.09)                 |
| 65.30208    | 2.86(.01)                   | 65.30340    | 2.77(.01)                   | 65.30522    | 2.48(.01)                   |
| 759.8       | 3.23( 0.37)                 | 759.7       | 2.89( 0.12)                 | 760.1       | 2.64( 0.16)                 |
| 65.41338    | 2.77(.01)                   | 65.41547    | 2.80(.01)                   | 65.41613    | 2.74(.02)                   |
| 759.6       | 3.02( 0.25)                 | 759.9       | 2.69(-0.11)                 | 759.9       | 2.46(-0.28)                 |
| 65.51295    | 2.90(.01)                   | 65.51658    | 2.20(.01)                   | 65.51760    | 2.49(.01)                   |
| 759.5       | 2.83(-0.07)                 | 759.8       | 2.52( 0.32)                 | 760.0       | 2.30(-0.19)                 |
| 65.63262    | 2.38(.01)                   | 65.63418    | 2.17(.01)                   | 65.63557    | 2.17(.01)                   |
| 760.0       | 2.63( 0.25)                 | 760.0       | 2.34( 0.17)                 | 760.0       | 2.13(-0.04)                 |
| 65.72641    | 2.30(.01)                   | 65.72845    | 2.00(.01)                   | 65.72974    | 1.61(.01)                   |
| 759.6       | 2.48( 0.18)                 | 759.9       | 2.20( 0.20)                 | 760.0       | 2.00( 0.39)                 |
| 65.83128    | 1.75(.01)                   | 65.83289    | 1.77(.01)                   | 65.83430    | 1.72(.01)                   |
| 759.9       | 2.32( 0.57)                 | 759.9       | 2.05( 0.28)                 | 759.8       | 1.87( 0.15)                 |
| 65.93547    | 1.82(.01)                   | 65.93710    | 1.64(.01)                   | 65.93869    | 1.28(.01)                   |
| 759.6       | 2.18( 0.36)                 | 759.8       | 1.92( 0.28)                 | 760.0       | 1.74( 0.46)                 |
| 66.04204    | 1.39(.01)                   | 66.04338    | 1.33(.01)                   | 66.04523    | 1.24(.01)                   |
| 759.8       | 2.04( 0.65)                 | 759.6       | 1.79( 0.46)                 | 760.0       | 1.62( 0.38)                 |
| 66.14628    | 1.62(.01)                   | 66.14841    | 1.53(.01)                   | 66.14907    | 1.42(.01)                   |
| 759.5       | 1.91( 0.29)                 | 760.0       | 1.67( 0.14)                 | 760.0       | 1.51( 0.09)                 |
| 66.24697    | 1.61(.01)                   | 66.25065    | 0.97(.01)                   | 66.25169    | 1.13(.01)                   |
| 759.5       | 1.80( 0.19)                 | 759.9       | 1.56( 0.59)                 | 760.0       | 1.41( 0.28)                 |



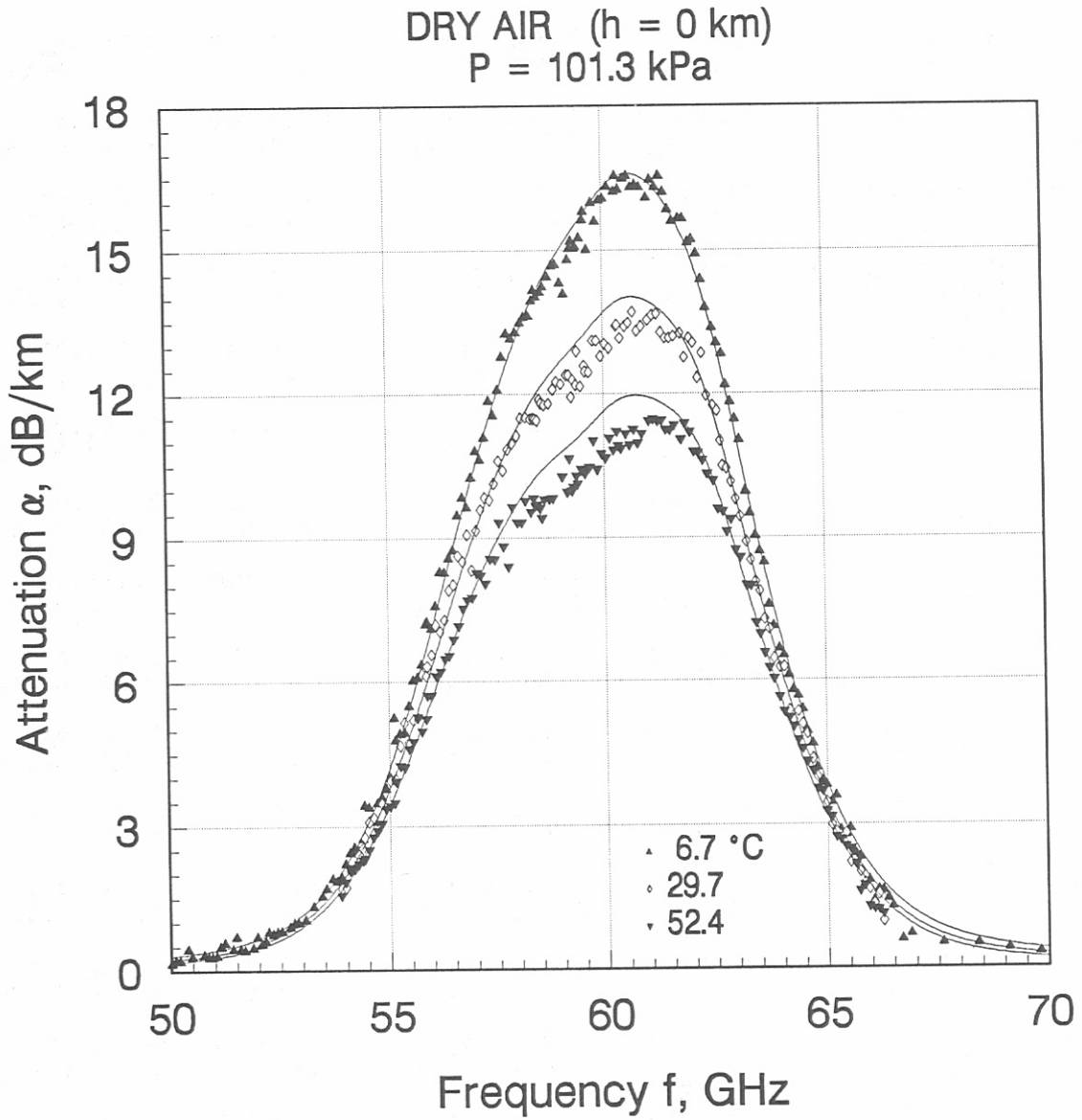


Figure A-11a. Predicted and measured attenuation rates of dry air,  $\alpha_M$  and  $\alpha_x$ , at  $H = 0$  km (see L.) for frequencies between 50 and 70 GHz.

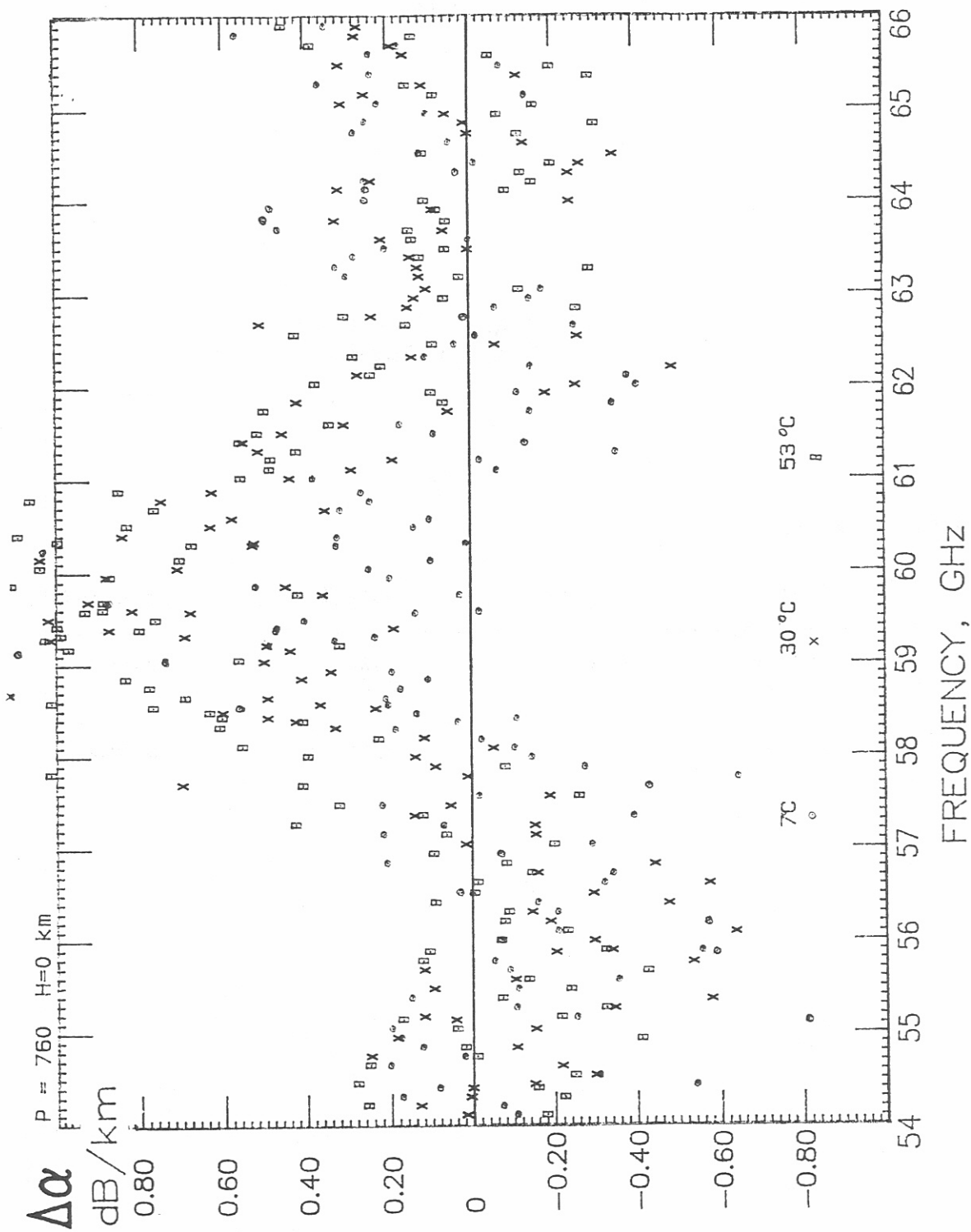


Figure A-11b. Differences  $\Delta\alpha = \alpha_M - \alpha_x$  between predicted and measured attenuation for the results listed under L.