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Supplementary Material

Contents

1 Supplementary Figures and Tables

1.1 Supplementary Figures

1.1.1 One dimensional potential energy scan for the internal rotation of the methyl top at B3LYP-D3/aug-cc-pVTZ and MP2/ aug-cc-pVTZ.

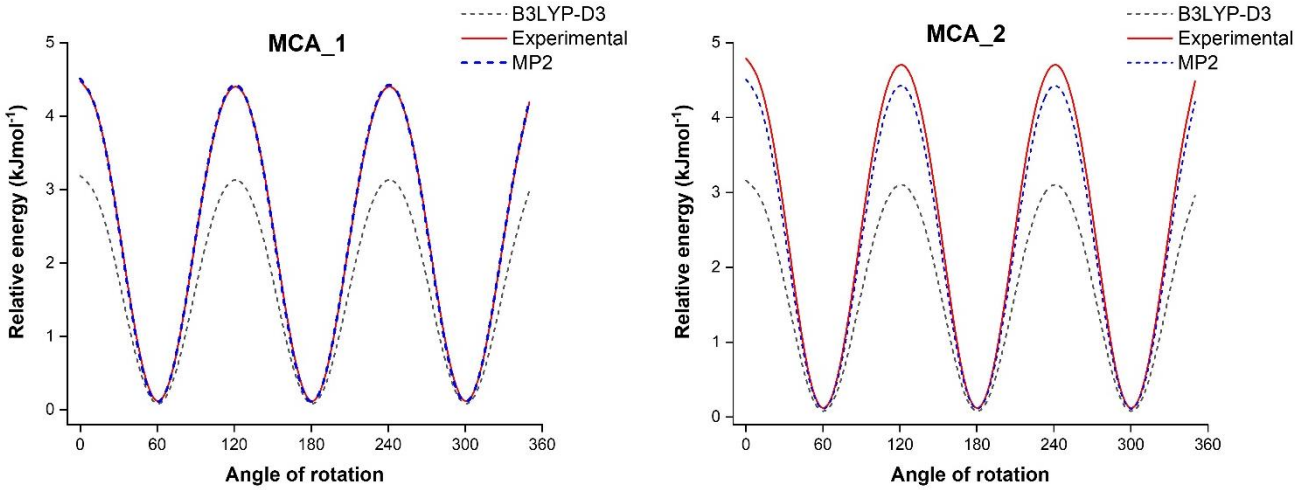

Figure S1. One dimensional potential energy scan for the internal rotation of the methyl top in (A) MCA_1 and (B) MCA_2. The scan was performed for the dihedral angle H-H_2C-O-C, at two different levels of theory: B3LYP-D3/aug-cc-pVTZ and MP2/ aug-cc-pVTZ, with a step size of 10°. The bold line shows the experimentally obtained barrier height and the dashed line shows the theoretically obtained barrier height at two different levels of theory.

1.1.2 Potential energy scan of dihedral angle θ, given by NC-CH_2-C=O at B3LYP-D3/aug-cc-pVTZ level of theory.

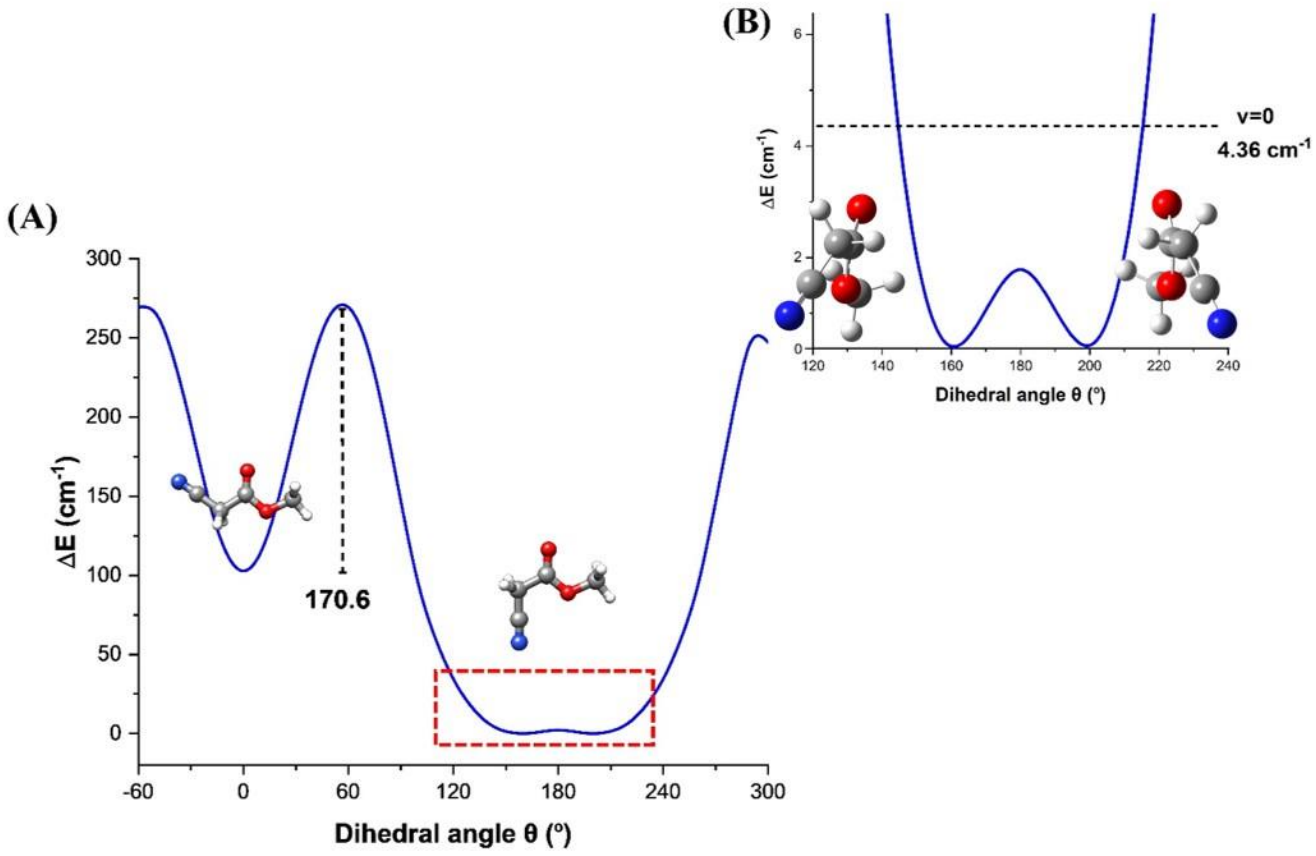

Figure S2. (A) One dimensional potential energy scan of the dihedral angle θ, given by NC-CH2-C=O. The scan was performed at B3LYP-D3/aug-cc-pVTZ level of theory, with the step size of 10°**.** (B) Zoom-in to show the interconversion barrier between the enantiomeric pair of MCA_1 with respect to the vibronic ground state.

1.2 Supplementary Tables

1.2.1 Single point energy calculations for MCA_1 and MCA_2.

Table S1: Single point energy calculations for MCA_1 and MCA_2 at higher levels of theory in comparison to the B3LYP-D3/aug-cc-pVTZ level of theory as indicated in the main manuscript.

Method	$\Delta E = E_{(MCA\_2)} - E_{(MCA\_1)}$
B3LYP-D3/aug-cc-pVTZ	1.4 kJ/mol
RI-MP2/cc-pVTZ	0.4 kJ/mol
DLPNO-CCSD(T)/CBS extrapolation based on aug-cc-pVnZ (n=T,Q) calculations, with TightPNO settings	0.1 kJ/mol

1.2.2 Summary of the experimental conditions.

Table S2: Summary of the experiments performed at different frequency ranges.

Frequency range (GHz)	Spectrometer used	Estimated T_{rot} achieved (K)	Expected Frequency accuracy (kHz)	Resolution (kHz)	Averages collected (M)
2-8	COMPACT	1-3	15	25	4.0
8-13	COMPACT	1-3	20	50	4.5
13-18	COMPACT	1-3	20	50	4.5
18-26	*K*-band	1-3	20	100	2.5
75-110	*W*-band	300	30	250	4.0

1.2.3 Experimental rotational constants obtained for the parent and the observed isotopologues of MCA_1.

Table S3. Experimental rotational constants obtained for the parent and the observed isotopologues of MCA_1. Parameters obtained from a fit of the A-state using SPFIT in the 2-26 GHz region.

	Parent	$^{13}C_1$	$^{13}C_3$	$^{3}C_5$	$^{13}C_6$	$^{15}N_7$
A (MHz)[a]	5069.78816(66)[b]	4986.4697(84)	5055.585(53)	5014.768(45)	5069.585(61)	5041.423(35)
B (MHz)	1842.95654(37)	1816.2130(15)	1840.7430(18)	1838.0052(12)	1819.6142(17)	1794.7896(17)
C (MHz)	1383.83241(32)	1362.5285(17)	1381.5191(16)	1377.1700(12)	1370.5870(15)	1354.5013(13)
D_J (KHz)	0.4838(45)	0.4630(77)	0.5060(98)	0.4607(84)	0.444(10)	0.4808(94)
D_{JK} (KHz)	1.220(19)	[1.220][c]	[1.220]	[1.220]	[1.220]	[1.220]
D_K (KHz)	4.352(57)	[4.352]	[4.352]	[4.352]	[4.352]	[4.352]
d_1 (KHz)	-0.1782(30)	0.195(10)	-0.153(10)	-0.1967(96)	-0.160(11)	-0.1355(94)
d_2 (KHz)	-0.0253(43)	0.0547(87)	[-0.0253]	-0.047(11)	-0.102(15)	[-0.0253]
χ_{aa} (MHz)	-1.1895(44)	-1.103(9)	-1.204(12)	-1.157(11)	-1.173(14)	-
χ_{bb}- χ_{cc} (MHz)	-2.7592(84)	-2.769(28)	-2.772(35)	-2.774(26)	-3.312(72)	-
N	320	55	57	66	58	25
σ (kHz)	14.5	11.0	14.2	12.9	14.3	11.1

[a]*A*, *B*, and *C* are the rotational constants. σ is the root-mean square deviation of the fit, D_J, D_{JK}, D_K, d_1 and $d_2$are the quartic centrifugal distortion constants. χ_{aa}, χ_{bb} and χ_{cc} are the quadrupole coupling tensor diagonal elements for ^{14}N atom. [b]Standard error in parentheses in units of the last digit. [c] Parameters in square brackets were kept fixed as the parent value.

1.2.4 Experimental rotational constants obtained for the parent and the observed isotopologues of MCA_2.

Table S4. Experimental rotational constants obtained for the parent and the observed isotopologues of MCA_2. Parameters obtained from a fit of the A-state using SPFIT in the 2-26 GHz region.

	Parent	$^{13}C_1$	$^{13}C_3$	$^{3}C_4$	$^{13}C_5$	$^{15}N_6$
A (MHz)[a]	9430.6654(32)[b]	9427.7533(75)	9431.037(61)	9289.6717(73)	9422.6546(80)	9415.2687(85)
B (MHz)	1413.54814(45)	1384.1964(23)	1412.9177(19)	1411.3114(10)	1397.3314(17)	1377.5203(11)
C (MHz)	1249.84446(41)	1226.7903(15)	1249.3600(16)	1245.6090(10)	1237.0170(11)	1221.3503(10)
D_J (KHz)	0.1457(28)	0.172(13)	0.1424(93)	0.1524(65)	0.1310(84)	0.1509(79)
D_{JK} (KHz)	-0.444(28)	-1.77(36)	[-0.444]	[-0.444]	[-0.444]	[-0.444]
D_K (KHz)	12.69(68)	[12.69][d]	[12.69]	[12.69]	[12.69]	[12.69]
d_1 (KHz)	-0.0187(15)	-0.076(12)	[-0.0187]	[-0.0187]	[-0.0187]	[-0.0187]
d_2 (KHz)	[-0.001][c]	[-0.001]	[-0.001]	[-0.001]	[-0.001]	[-0.001]
χ_{aa} (MHz)	-2.959(7)	-2.953(29)	-3.07(19)	-2.955(64)	-2.848(46)	-
$(\chi_{bb}-\chi_{cc})$ (MHz)	-1.115(16)	-1.124(60)	-1.56(68)	-1.092(88)	-1.216(76)	-
N	319	58	50	65	46	22
σ (kHz)	20.3	17.2	21.2	20.5	18.3	17.4

[a] *A*, *B*, and *C* are the rotational constants. σ is the root-mean square deviation of the fit, D_J, D_{JK}, D_K, d_1 and $d_2$are the quartic centrifugal distortion constants. χ_{aa}, χ_{bb} and χ_{cc} are the quadrupole coupling tensor diagonal elements for ^{14}N atom. [b] Standard error in parentheses in units of the last digit. [c] Parameter fixed to the value of the XIAM fit including A and E states in the 2-26 GHz and 75-110 GHz frequency regions. [d]Parameters in square brackets were kept fixed as the parent value.

1.2.5 Atomic coordinates for the nuclei of MCA_1.

Table S5. Atomic coordinates for the nuclei of MCA_1 obtained from r_e, r_s, and $r_m^{(1)}$ structures.

		C_1	O_2	C_3	O_4	C_5	C_6	N_7
	r_e	-2.00	-0.67	-0.59	-1.52	0.86	1.89	2.73
a	r_s	-2.0074(7)	-	-0.576(2)	-	0.840(1)	1.8829(8)	2.7250(6)
	$r_m^{(1)}$	-2.012(5)	-0.69(1)	-0.58(2)	-1.50(2)	0.862(7)	1.889(4)	2.730(3)
	r_e	1.33	0.78	-0.55	-1.30	-1.05	-0.02	0.76
b	r_s	1.311(1)	-	-0.532(3)	-	-1.035(1)	-0.09(2)	0.765(2)
	$r_m^{(1)}$	1.312(7)	0.80(1)	-0.53(2)	-1.32(2)	-1.037(8)	-0.03(2)	0.77(1)
	r_e	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*c**	r_s	[0]	-	[0]	-	[0]	[0]	[0]
	$r_m^{(1)}$	0.00058(7)	0.0063(4)	0.0006(1)	0.0088(7)	0.0095(6)	0.000(1)	-0.008(1)

*Due to the high uncertainties and imaginary values observed in the calculation of the *c* atomic coordinates for most of the isotopologues, the c atomic coordinates were fixed to zero

1.2.6 Atomic coordinates for the nuclei of MCA_2.

Table S6. Atomic coordinates for the nuclei of MCA_2 obtained from r_e, r_s, and $r_m^{(1)}$ structures.

		C_1	O_2	C_3	C_5	C_6	N_7	O_4
	r_e	2.77	1.56	0.42	-0.77	-2.05	-3.08	0.36
a	r_s	2.7627(5)	-	0.400(4)	-0.752(2)	-2.0435(7)	-3.0770(5)	-
	$r_m^{(1)}$	2.764(2)	1.57(1)	0.41(1)	-0.756(7)	-2.045(2)	-3.078(1)	0.35(2)
	r_e	-0.11	0.66	-0.06	0.90	0.22	-0.29	-1.25
b	r_s	-0.13(1)	-	[0]	0.904(1)	0.213(7)	-0.298(5)	-
	$r_m^{(1)}$	-0.14(2)	0.67(3)	-0.05(2)	0.907(5)	0.22(2)	-0.306(1)	-1.24(1)
	r_e	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*c**	r_s	[0]	-	[0]	-	[0]	[0]	[0]
	$r_m^{(1)}$	0.001(2)	0.001(1)	0.001(1)	0.001(1)	0.001(4)	0.002(5)	0.001(2)

*Due to the high uncertainties and imaginary values observed in the calculation of the *c* atomic coordinates for most of the isotopologues, the *c* atomic coordinates were fixed to zero.

1.2.7 Bond distances, angles, and dihedral angles of MCA_1.

Table S7. Molecular bond distances, angles, and dihedral angles for MCA_1 obtained from r_e, r_s, and $r_m^{(1)}$ structures.

Bond distances (Å)	r_e	r_s	$r_m^{(1)}$
C_1-O_2	1.44	-	1.42(1)
O_2-C_3	1.33	-	1.33(2)
C_3-O_4	1.20	-	1.21(2)
C_3-C_5	1.53	1.50(3)	1.53(2)
C_5-C_6	1.45	1.41(1)	1.44(2)
C_6-N_7	1.15	1.20(1)	1.16(2)
Angles (°)	r_e	r_s	$r_m^{(1)}$
C_1-O_2-C_3	115.8	-	[115.8]
O_2-C_3-O_4	125.4	-	126(2)
O_2-C_3-C_5	112.6	-	113.8(7)
C_3-C_5-C_6	116.2	118.23(5)	116.2(9)
C_4-C_3-N_5	122	-	-
C_5-C_6-N_7	178.6	176.79(1)	179(2)
Dihedral angles (°)	r_e	r_s^*	$r_m^{(1)}$
C_1-O_2-C_3-O_4	0.0	-	-
C_1-O_2-C_3-C_5	-179.9	-	-
O_2-C_3-O_4-C_6	-1.0	-	-
C_3-C_5-C_6-N_7	-174.5	[0]	-
C_1-C_3-C_5-C_6	-1.0	[0]	-
C_1-C_5-C_6-N_7	-174.9	[0]	-

*The dihedral angles were calculated to be zero as a result of fixing the atomic coordinate *c* to zero, due to high uncertainties observed in the calculation of this coordinate.

1.2.8 Bond distances, angles, and dihedral angles of MCA_2.

Table S8. Molecular bond distances, angles and dihedral angles for MCA_2 obtained from r_e, r_s, and $r_m^{(1)}$ structures.

Bond distances (Å)	r_e	r_s	$r_m^{(1)}$
C_1-O_2	1.44	-	1.45(2)
O_2-C_3	1.34	-	1.36(3)
C_3-O_4	1.20	-	1.19(2)
C_3-C_5	1.52	1.47(2)	1.51(1)
C_5-C_6	1.45	1.46(2)	1.46(1)
C_6-N_7	1.15	1.16(1)	1.16(1)

Angles (°)	r_e	r_s	$r_m^{(1)}$
C_1-O_2-C_3	115.4	-	113(1)
O_2-C_3-O_4	125.1	-	[125.1]
O_2-C_3-C_5	109.0	-	108(1)
C_3-C_5-C_6	113.3	113.71(1)	112.8(9)
C_5-C_6-N_7	178.2	176(4)	179(2)

Dihedral angles (°)	r_e	r_s^*	$r_m^{(1)}$
C_1-O_2-C_3-O_4	0.0	-	-
C_1-O_2-C_3-C_5	180.0	-	-
O_2-C_3-C_5-C_6	180.0	-	-
C_3-C_5-C_6-N_7	163.3	[180]	-
C_1-C_3-C_5-C_6	180.0	[180]	-
C_1-C_5-C_6-N_7	163.3	[180]	-

*The dihedral angles were calculated to be zero as a result of fixing the atomic coordinate *c* to zero, due to high uncertainties observed in the calculation of this coordinate.

1.2.9 MCA_1 XIAM line list in the frequency range of 2-110 GHz.

Table S9: Measured frequencies and residuals (in MHz) for the rotational transitions of MCA_1 in the frequency range of 2-110 GHz using XIAM.

J	Ka	Kc	J'	Ka'	Kc'	F	F'	Sym	Observed Freq (MHz)	Residuals (MHz)
6	2	4	6	2	5	5	5	/A	2709.1771	-0.0068
6	2	4	6	2	5	7	7	/A	2709.2514	-0.0092
6	2	4	6	2	5	6	6	/A	2709.7049	-0.0100
6	2	4	6	2	5	5	5	/E	2709.9076	-0.0152
6	2	4	6	2	5	7	7	/E	2709.9783	-0.0212
6	2	4	6	2	5	6	6	/E	2710.4334	-0.0204
3	1	2	3	1	3	2	2	/E	2751.3042	-0.0036
3	1	2	3	1	3	2	2	/A	2751.3042	0.0069
3	1	2	3	1	3	3	2	/E	2751.4982	-0.0021
3	1	2	3	1	3	3	2	/A	2751.4982	0.0084
3	1	2	3	1	3	4	4	/E	2751.6289	-0.0005
3	1	2	3	1	3	4	4	/A	2751.6289	0.0100
3	1	2	3	1	3	3	4	/A	2751.7695	0.0080
3	1	2	3	1	3	3	4	/E	2751.7695	-0.0025
3	1	2	3	1	3	3	3	/A	2752.5435	0.0057
3	1	2	3	1	3	3	3	/E	2752.5435	-0.0048
1	0	1	0	0	0	1	1	/E	3226.4763	0.0149
1	0	1	0	0	0	1	1	/A	3226.4763	-0.0138
1	0	1	0	0	0	2	1	/A	3226.8292	-0.0191
1	0	1	0	0	0	2	1	/E	3226.8292	0.0096
1	0	1	0	0	0	0	1	/E	3227.3744	0.0176
1	0	1	0	0	0	0	1	/A	3227.3744	-0.0111
1	1	0	1	0	1	0	1	/E	3684.9988	0.0033
1	1	0	1	0	1	0	1	/A	3685.2560	-0.0014
1	1	0	1	0	1	2	2	/E	3685.5323	0.0056
1	1	0	1	0	1	1	0	/E	3685.5786	-0.0038
1	1	0	1	0	1	2	2	/A	3685.7911	0.0012
1	1	0	1	0	1	1	0	/A	3685.8639	0.0174
1	1	0	1	0	1	2	1	/E	3685.8797	-0.0052
1	1	0	1	0	1	1	2	/E	3686.1165	-0.0031
1	1	0	1	0	1	2	1	/A	3686.1549	0.0068
1	1	0	1	0	1	1	2	/A	3686.3834	-0.0003
1	1	0	1	0	1	1	1	/E	3686.4805	0.0027
1	1	0	1	0	1	1	1	/A	3686.7430	0.0011
2	1	1	2	0	2	1	1	/E	4189.5024	-0.0017
2	1	1	2	0	2	3	3	/E	4189.8922	0.0036
2	1	1	2	0	2	1	1	/A	4190.1080	-0.0057
2	1	1	2	0	2	1	2	/E	4190.1875	-0.0008
2	1	1	2	0	2	3	2	/E	4190.3300	0.0015
2	1	1	2	0	2	3	3	/A	4190.4991	0.0008
2	1	1	2	0	2	2	2	/E	4190.5810	0.0001
2	1	1	2	0	2	1	2	/A	4190.7810	-0.0169

2	1	1	2	0	2	3	2	/A	4190.9380	-0.0002
2	1	1	2	0	2	2	2	/A	4191.1900	-0.0007
4	1	3	4	1	4	3	3	/E	4570.6588	0.0209
4	1	3	4	1	4	3	3	/A	4570.8000	-0.0051
4	1	3	4	1	4	5	5	/E	4570.8806	0.0033
4	1	3	4	1	4	5	5	/A	4571.0461	0.0016
4	1	3	4	1	4	4	4	/E	4571.8091	0.0007
4	1	3	4	1	4	4	4	/A	4571.9729	-0.0027
3	1	2	3	0	3	2	2	/E	5027.5800	-0.0007
3	1	2	3	0	3	4	4	/E	5027.8195	-0.0001
3	1	2	3	0	3	2	2	/A	5028.2950	0.0000
3	1	2	3	0	3	3	3	/E	5028.4968	-0.0054
3	1	2	3	0	3	4	4	/A	5028.5280	-0.0059
3	1	2	3	0	3	3	3	/A	5029.2190	0.0026
2	1	2	1	1	1	2	2	/A	5993.9100	0.0019
2	1	2	1	1	1	2	1	/A	5994.1460	0.0023
2	1	2	1	1	1	2	2	/E	5994.2130	0.0020
2	1	2	1	1	1	2	1	/E	5994.4462	0.0004
2	1	2	1	1	1	3	2	/A	5994.5461	0.0018
2	1	2	1	1	1	3	2	/E	5994.8439	-0.0033
2	1	2	1	1	1	1	1	/A	5995.1289	-0.0045
2	1	2	1	1	1	1	1	/E	5995.4256	-0.0097
4	1	3	4	0	4	3	3	/E	6276.6713	-0.0070
4	1	3	4	0	4	5	5	/E	6276.8591	-0.0061
4	1	3	4	0	4	3	3	/A	6277.4497	-0.0041
4	1	3	4	0	4	4	4	/E	6277.6243	0.0323
4	1	3	4	0	4	5	5	/A	6277.6246	-0.0161
4	1	3	4	0	4	4	4	/A	6278.3663	-0.0012
1	1	1	0	0	0	1	1	/E	6452.1665	0.0041
1	1	1	0	0	0	2	1	/E	6452.4013	0.0042
1	1	1	0	0	0	0	1	/E	6452.7554	0.0061
1	1	1	0	0	0	1	1	/A	6453.4194	0.0013
1	1	1	0	0	0	2	1	/A	6453.6564	0.0027
1	1	1	0	0	0	0	1	/A	6454.0112	0.0040
3	0	3	2	1	2	2	1	/A	6687.4068	-0.0044
3	0	3	2	1	2	4	3	/A	6687.5711	-0.0046
3	0	3	2	1	2	3	2	/A	6687.6681	-0.0040
3	0	3	2	1	2	2	1	/E	6688.1645	-0.0111
3	0	3	2	1	2	4	3	/E	6688.3289	-0.0111
3	0	3	2	1	2	3	2	/E	6688.4259	-0.0103
2	1	1	1	1	0	1	1	/E	6911.5757	-0.0059
2	1	1	1	1	0	1	1	/A	6911.9622	-0.0258
2	1	1	1	1	0	2	1	/E	6911.9627	-0.0115
2	1	1	1	1	0	3	2	/E	6912.3051	-0.0096
2	1	1	1	1	0	2	1	/A	6912.3760	-0.0048
2	1	1	1	1	0	2	2	/E	6912.5544	-0.0127
2	1	1	1	1	0	3	2	/A	6912.7157	-0.0064
2	1	1	1	1	0	2	2	/A	6912.9670	-0.0076

2	1	1	1	1	0	1	0	/E	6913.0527	-0.0112
2	1	1	1	1	0	1	0	/A	6913.4650	-0.0075
5	2	3	5	1	4	5	5	/E	8604.7316	-0.0110
5	2	3	5	1	4	4	4	/A	8606.0500	0.0278
5	2	3	5	1	4	6	6	/A	8606.0500	0.0141
4	2	2	4	1	3	4	4	/E	8823.4440	-0.0149
4	2	2	4	1	3	3	3	/E	8823.4440	-0.0174
4	2	2	4	1	3	5	5	/E	8823.4440	-0.0169
4	2	2	4	1	3	3	3	/A	8824.2190	-0.0126
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4	2	2	4	1	3	5	5	/A	8824.2190	-0.0122
3	1	3	2	1	2	3	3	/A	8963.6874	-0.0270
3	1	3	2	1	2	3	3	/E	8963.7705	0.0165
3	1	3	2	1	2	3	2	/A	8964.3430	-0.0077
3	1	3	2	1	2	2	1	/A	8964.3974	-0.0116
3	1	3	2	1	2	3	2	/E	8964.3974	0.0073
3	1	3	2	1	2	2	1	/E	8964.4702	0.0217
3	1	3	2	1	2	4	3	/A	8964.4804	-0.0103
3	1	3	2	1	2	4	3	/E	8964.5514	0.0212
3	1	3	2	1	2	2	2	/A	8965.3701	-0.0286
3	1	3	2	1	2	2	2	/E	8965.4561	0.0180
2	1	2	1	0	1	2	2	/E	9219.7861	-0.0025
2	1	2	1	0	1	2	1	/E	9220.1380	-0.0087
2	1	2	1	0	1	1	0	/E	9220.2400	-0.0008
2	1	2	1	0	1	3	2	/E	9220.4229	-0.0018
2	1	2	1	0	1	2	2	/A	9220.7150	0.0015
2	1	2	1	0	1	2	1	/A	9221.0750	0.0034
2	1	2	1	0	1	3	2	/A	9221.3500	0.0003
2	1	2	1	0	1	1	1	/A	9222.0610	-0.0003
3	2	1	3	1	2	4	4	/A	9246.8060	0.0013
3	2	1	3	1	2	4	4	/E	9248.4814	0.0065
3	0	3	2	0	2	3	3	/E	9500.2641	-0.0079
3	0	3	2	0	2	3	3	/A	9500.3750	0.0032
3	0	3	2	0	2	3	2	/E	9500.7001	-0.0118
3	0	3	2	0	2	2	1	/E	9500.7981	0.0416
3	0	3	2	0	2	4	3	/E	9500.7981	-0.0138
3	0	3	2	0	2	3	2	/A	9500.8000	-0.0117
3	0	3	2	0	2	2	1	/A	9500.8504	-0.0059
3	0	3	2	0	2	4	3	/A	9500.9250	0.0133
3	0	3	2	0	2	2	2	/E	9501.4320	-0.0088
3	0	3	2	0	2	2	2	/A	9501.5490	0.0084
3	2	2	2	2	1	3	2	/A	9679.9870	-0.0097
3	2	2	2	2	1	4	3	/A	9680.3750	-0.0054
3	2	2	2	2	1	2	1	/A	9680.6000	0.0064
2	2	0	2	1	1	1	1	/A	9725.8500	-0.0057
2	2	0	2	1	1	3	3	/A	9725.9720	0.0122
2	2	0	2	1	1	2	2	/A	9726.1490	0.0018
3	2	1	2	2	0	2	2	/A	9859.2990	-0.0036

3	2	1	2	2	0	3	2	/A	9859.4890	-0.0053
3	2	1	2	2	0	4	3	/A	9859.7930	0.0008
3	2	1	2	2	0	2	1	/A	9859.9830	-0.0039
4	0	4	3	1	3	3	2	/A	10198.9000	-0.0080
4	0	4	3	1	3	5	4	/A	10199.0140	0.0026
4	0	4	3	1	3	4	3	/A	10199.1352	0.0021
4	0	4	3	1	3	3	2	/E	10199.4808	-0.0076
4	0	4	3	1	3	5	4	/E	10199.6012	0.0094
4	0	4	3	1	3	4	3	/E	10199.7005	-0.0130
3	1	2	2	1	1	2	2	/E	10338.4310	-0.0096
3	1	2	2	1	1	2	2	/A	10338.6198	-0.0251
3	1	2	2	1	1	3	2	/E	10338.6198	-0.0133
3	1	2	2	1	1	4	3	/E	10338.7338	-0.0091
3	1	2	2	1	1	2	1	/E	10338.8271	-0.0061
3	1	2	2	1	1	3	2	/A	10338.8272	-0.0103
3	1	2	2	1	1	4	3	/A	10338.9414	-0.0059
2	2	1	2	1	2	1	1	/E	11039.9336	0.0017
2	2	1	2	1	2	1	1	/A	11056.9750	-0.0055
2	2	1	2	1	2	3	3	/A	11057.5700	0.0228
2	2	1	2	1	2	2	2	/A	11058.5740	0.0068
3	2	2	3	1	3	2	2	/E	11767.0419	0.0067
3	2	2	3	1	3	4	4	/E	11767.3105	0.0028
3	2	2	3	1	3	3	3	/E	11768.0828	-0.0036
3	2	2	3	1	3	2	2	/A	11773.1640	-0.0012
3	2	2	3	1	3	4	4	/A	11773.4360	-0.0009
3	2	2	3	1	3	3	3	/A	11774.2050	-0.0082
3	1	3	2	0	2	3	3	/E	11776.2195	-0.0064
3	1	3	2	0	2	3	2	/E	11776.6681	0.0024
3	1	3	2	0	2	2	1	/E	11777.0034	-0.0261
3	1	3	2	0	2	4	3	/E	11777.0034	0.0013
3	1	3	2	0	2	3	2	/A	11777.5010	0.0107
3	1	3	2	0	2	2	2	/E	11777.7285	0.0148
3	1	3	2	0	2	2	1	/A	11777.8380	-0.0161
3	1	3	2	0	2	4	3	/A	11777.8400	0.0133
3	1	3	2	0	2	2	2	/A	11778.5480	0.0097
4	1	4	3	1	3	3	2	/E	11905.5235	-0.0053
4	1	4	3	1	3	4	3	/E	11905.5235	0.0265
4	1	4	3	1	3	4	3	/A	11905.5235	-0.0014
4	1	4	3	1	3	3	2	/A	11905.5235	-0.0332
4	1	4	3	1	3	5	4	/A	11905.6323	0.0248
4	0	4	3	0	3	3	2	/E	12475.7532	-0.0082
4	0	4	3	0	3	5	4	/E	12475.7532	-0.0288
4	0	4	3	0	3	3	2	/A	12475.9220	0.0163
4	0	4	3	0	3	5	4	/A	12475.9220	-0.0044
4	2	3	4	1	4	3	3	/E	12735.5323	0.0015
4	2	3	4	1	4	5	5	/E	12735.7109	0.0045
4	2	3	4	1	4	4	4	/E	12736.3952	0.0062
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4	2	3	4	1	4	5	5	/A	12739.3380	-0.0024
4	2	3	4	1	4	4	4	/A	12740.0170	-0.0055
4	2	3	3	2	2	4	3	/A	12871.3500	0.0157
4	2	3	3	2	2	5	4	/A	12871.5000	-0.0110
4	2	3	3	2	2	3	2	/A	12871.5903	0.0338
4	2	3	3	2	2	4	3	/E	12873.7956	-0.0040
4	2	3	3	2	2	5	4	/E	12873.9566	-0.0217
4	2	3	3	2	2	3	2	/E	12874.0443	0.0198
4	3	2	3	3	1	4	3	/A	12989.9420	-0.0104
4	3	2	3	3	1	5	4	/A	12990.2690	-0.0137
4	3	2	3	3	1	3	2	/A	12990.4000	-0.0154
4	3	2	3	3	1	4	3	/E	12997.4017	0.0064
4	3	2	3	3	1	5	4	/E	12997.7269	0.0045
4	3	2	3	3	1	3	2	/E	12997.8740	0.0195
4	3	1	3	3	0	4	3	/E	12999.2598	-0.0289
4	3	1	3	3	0	5	4	/E	12999.6100	-0.0035
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4	3	1	3	3	0	4	3	/A	13006.9030	-0.0183
4	3	1	3	3	0	5	4	/A	13007.2640	0.0211
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4	2	2	3	2	1	4	3	/E	13299.7634	0.0192
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5	0	5	4	1	4	6	5	/A	13625.6550	0.0050
5	0	5	4	1	4	6	5	/E	13626.0818	0.0092
4	1	3	3	1	2	4	3	/E	13724.7354	-0.0217
4	1	3	3	1	2	5	4	/E	13724.8125	-0.0150
4	1	3	3	1	2	4	3	/A	13724.9168	-0.0459
4	1	3	3	1	2	5	4	/A	13725.0325	-0.0006
4	1	3	3	1	2	3	2	/A	13725.0325	-0.0320
4	1	4	3	0	3	4	3	/E	14181.4524	0.0016
4	1	4	3	0	3	5	4	/E	14181.7307	-0.0391
4	1	4	3	0	3	4	3	/A	14182.1950	-0.0085
4	1	4	3	0	3	5	4	/A	14182.4920	-0.0306
5	1	5	4	1	4	5	5	/E	14813.0830	0.0159
5	1	5	4	1	4	5	5	/A	14813.1581	0.0275
5	1	5	4	1	4	5	4	/A	14814.0050	0.0155
5	1	5	4	1	4	6	5	/E	14814.0050	0.0168
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5	1	5	4	1	4	4	4	/E	14815.0660	0.0313
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5	0	5	4	0	4	5	4	/E	15331.9327	-0.0115
5	0	5	4	0	4	4	3	/E	15332.0758	0.0267
5	0	5	4	0	4	6	5	/E	15332.0758	0.0154
5	0	5	4	0	4	4	3	/A	15332.2550	0.0202
5	0	5	4	0	4	6	5	/A	15332.2550	0.0088
5	2	4	4	2	3	4	3	/A	16032.5256	0.0226
5	2	4	4	2	3	6	5	/A	16032.5256	0.0351

5	2	4	4	2	3	5	4	/E	16032.9813	-0.0110
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5	2	4	4	2	3	6	5	/E	16033.1215	0.0213
5	1	5	4	0	4	5	4	/E	16519.7206	0.0111
5	1	5	4	0	4	6	5	/E	16519.9947	0.0187
5	1	5	4	0	4	4	3	/E	16519.9947	-0.0006
5	1	5	4	0	4	5	4	/A	16520.3910	0.0096
5	1	5	4	0	4	4	3	/A	16520.6770	0.0098
5	1	5	4	0	4	6	5	/A	16520.6770	0.0291
2	2	1	1	1	0	1	1	/A	16592.2980	-0.0020
2	2	1	1	1	0	2	1	/A	16592.8880	-0.0089
2	2	1	1	1	0	3	2	/A	16593.0950	-0.0120
2	2	1	1	1	0	2	2	/A	16593.4750	-0.0157
2	2	1	1	1	0	1	0	/A	16593.7650	-0.0195
4	3	1	4	2	2	3	3	/A	16791.2919	0.0070
4	3	1	4	2	2	5	5	/A	16791.2919	-0.0251
5	1	4	4	1	3	5	4	/E	17050.6303	0.0109
5	1	4	4	1	3	5	4	/A	17050.8880	0.0206
5	1	4	4	1	3	6	5	/A	17050.8880	-0.0461
3	3	0	3	2	1	2	2	/A	17086.3767	-0.0257
3	3	0	3	2	1	4	4	/A	17086.5211	-0.0127
3	3	0	3	2	1	3	3	/A	17086.8891	-0.0199
2	2	0	1	1	1	1	0	/A	17097.0690	0.0004
2	2	0	1	1	1	3	2	/A	17097.6670	0.0006
2	2	0	1	1	1	2	2	/A	17098.1120	0.0057
2	2	0	1	1	1	2	1	/A	17098.3430	0.0011
3	3	1	3	2	2	4	4	/A	17308.6870	0.0115
3	3	1	3	2	2	3	3	/A	17309.2160	0.0261
6	0	6	5	0	5	7	6	/E	18101.7230	0.0062
6	0	6	5	0	5	5	4	/E	18101.7230	0.0156
6	0	6	5	0	5	5	4	/A	18101.9650	0.0456
6	0	6	5	0	5	7	6	/A	18101.9650	0.0363
6	1	6	5	0	5	6	5	/E	18877.3980	0.0265
6	1	6	5	0	5	5	4	/E	18877.5930	0.0116
6	1	6	5	0	5	7	6	/E	18877.5930	0.0189
6	1	6	5	0	5	6	5	/A	18877.9830	0.0357
6	1	6	5	0	5	5	4	/A	18878.1700	0.0127
6	1	6	5	0	5	7	6	/A	18878.1700	0.0200
6	2	5	5	2	4	7	6	/A	19156.5820	-0.0103
6	2	5	5	2	4	5	4	/A	19156.5820	-0.0138
6	2	5	5	2	4	7	6	/E	19156.7830	0.0869
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3	2	2	2	1	1	3	2	/E	19354.1710	-0.0003
3	2	2	2	1	1	4	3	/E	19354.4610	0.0398
3	2	2	2	1	1	3	2	/A	19360.5230	0.0102
3	2	2	2	1	1	4	3	/A	19360.8010	0.0357
6	4	3	5	4	2	5	4	/A	19513.4680	-0.0679
6	4	3	5	4	2	7	6	/A	19513.4680	-0.0295

6	4	3	5	4	2	6	5	/E	19515.8870	0.0145
6	4	2	5	4	1	5	4	/E	19515.8880	-0.0625
6	4	2	5	4	1	7	6	/E	19515.8880	-0.0242
6	4	3	5	4	2	5	4	/E	19516.0480	-0.0313
6	4	3	5	4	2	7	6	/E	19516.0480	0.0070
6	4	2	5	4	1	7	6	/A	19518.7050	-0.0282
6	4	2	5	4	1	5	4	/A	19518.7050	-0.0664
6	3	4	5	3	3	6	5	/A	19538.9900	-0.0168
6	3	4	5	3	3	7	6	/A	19539.1570	0.0543
6	3	4	5	3	3	5	4	/A	19539.1570	0.0375
6	3	4	5	3	3	5	4	/E	19551.0090	0.0223
6	3	4	5	3	3	7	6	/E	19551.0090	0.0398
6	3	3	5	3	2	7	6	/E	19679.0850	0.0125
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6	3	3	5	3	2	5	4	/E	19679.0850	0.0010
6	3	3	5	3	2	5	4	/A	19691.2310	0.0207
6	3	3	5	3	2	7	6	/A	19691.2310	0.0329
7	0	7	6	1	6	6	5	/A	20054.1310	0.0478
7	0	7	6	1	6	8	7	/A	20054.1310	0.0218
7	0	7	6	1	6	7	6	/A	20054.1310	0.0078
7	0	7	6	1	6	8	7	/E	20054.2550	0.0011
7	0	7	6	1	6	6	5	/E	20054.2550	0.0270
7	0	7	6	1	6	7	6	/E	20054.2550	-0.0129
6	1	5	5	1	4	7	6	/E	20291.7420	0.0371
6	1	5	5	1	4	5	4	/E	20291.7420	0.0242
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6	2	4	5	2	3	7	6	/E	20409.2660	0.0028
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6	2	4	5	2	3	6	5	/A	20409.6850	-0.0027
7	1	7	6	1	6	6	5	/E	20535.7310	0.0537
7	1	7	6	1	6	7	6	/E	20535.7310	0.0821
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7	0	7	6	0	6	8	7	/E	20830.1630	0.0517
7	0	7	6	0	6	6	5	/E	20830.1630	0.0610
7	0	7	6	0	6	8	7	/A	20830.3510	0.0206
7	0	7	6	0	6	6	5	/A	20830.3510	0.0299
3	2	1	2	1	2	2	1	/A	20962.5280	0.0168
3	2	1	2	1	2	4	3	/A	20962.9340	0.0197
3	2	1	2	1	2	3	2	/A	20963.7050	0.0125
3	2	1	2	1	2	2	1	/E	20964.2690	0.0367
3	2	1	2	1	2	4	3	/E	20964.6590	0.0245

3	2	1	2	1	2	3	2	/E	20965.4360	0.0258
7	1	7	6	0	6	6	5	/E	21311.5350	-0.0163
7	1	7	6	0	6	8	7	/E	21311.5350	-0.0170
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7	1	7	6	0	6	6	5	/A	21312.0130	-0.0133
4	2	3	3	1	2	4	3	/E	21889.3680	0.0303
4	2	3	3	1	2	5	4	/E	21889.6540	-0.0026
4	2	3	3	1	2	4	3	/A	21893.0320	0.0224
4	2	3	3	1	2	5	4	/A	21893.3190	-0.0100
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7	2	6	6	2	5	7	6	/E	22238.0850	0.0174
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7	3	5	6	3	4	7	6	/A	22810.7330	0.0223
7	3	5	6	3	4	8	7	/A	22810.7830	0.0096
7	3	5	6	3	4	6	5	/A	22810.7830	0.0025
7	4	4	6	4	3	7	6	/E	22814.5880	0.0487
7	4	4	6	4	3	8	7	/E	22814.7050	0.0649
7	4	4	6	4	3	6	5	/E	22814.7050	0.0475
7	3	5	6	3	4	7	6	/E	22815.3950	0.0492
7	3	5	6	3	4	6	5	/E	22815.3950	-0.0224
7	3	5	6	3	4	8	7	/E	22815.3950	-0.0150
8	0	8	7	1	7	9	8	/E	23069.8730	-0.0185
8	0	8	7	1	7	7	6	/E	23069.8730	-0.0007
8	0	8	7	1	7	8	7	/E	23069.8730	-0.0122
8	0	8	7	1	7	7	6	/A	23069.8740	0.0428
8	0	8	7	1	7	8	7	/A	23069.8740	0.0312
8	0	8	7	1	7	9	8	/A	23069.8740	0.0249
7	3	4	6	3	3	7	6	/E	23133.0600	-0.0079
7	3	4	6	3	3	8	7	/E	23133.0600	-0.0189
7	3	4	6	3	3	6	5	/E	23133.0600	-0.0201
7	3	4	6	3	3	7	6	/A	23137.9750	-0.0123
7	3	4	6	3	3	6	5	/A	23137.9750	-0.0262
7	3	4	6	3	3	8	7	/A	23137.9750	-0.0247
8	1	8	7	1	7	8	7	/E	23357.1800	0.0040
8	1	8	7	1	7	9	8	/E	23357.1800	-0.0364
8	1	8	7	1	7	7	6	/E	23357.1800	-0.0229
8	1	8	7	1	7	8	7	/A	23357.3200	0.0158
8	1	8	7	1	7	7	6	/A	23357.3200	-0.0111
8	1	8	7	1	7	9	8	/A	23357.3200	-0.0246
7	1	6	6	1	5	8	7	/E	23421.2330	0.0379
7	1	6	6	1	5	6	5	/E	23421.2330	0.0269
7	1	6	6	1	5	8	7	/A	23421.6310	0.0470
7	1	6	6	1	5	6	5	/A	23421.6310	0.0361
8	0	8	7	0	7	7	6	/E	23551.3640	0.0410
8	0	8	7	0	7	9	8	/E	23551.3640	0.0318
8	0	8	7	0	7	7	6	/A	23551.5140	-0.0224
8	0	8	7	0	7	9	8	/A	23551.5140	-0.0317

8	0	8	7	0	7	8	7	/A	23551.5140	0.0343
8	1	8	7	0	7	7	6	/E	23838.6900	0.0378
8	1	8	7	0	7	9	8	/E	23838.6900	0.0329
8	1	8	7	0	7	9	8	/A	23839.0920	0.0508
8	1	8	7	0	7	7	6	/A	23839.0920	0.0558
5	4	1	5	3	2	6	6	/A	24013.9400	0.0296
5	4	1	5	3	2	5	5	/A	24014.1700	0.0230
5	2	4	4	1	3	5	4	/E	24197.6100	0.0370
5	2	4	4	1	3	4	3	/E	24197.9470	-0.0587
5	2	4	4	1	3	6	5	/E	24197.9470	0.0178
5	2	4	4	1	3	5	4	/A	24200.4530	0.0230
5	2	4	4	1	3	4	3	/A	24200.7980	-0.0649
5	2	4	4	1	3	6	5	/A	24200.7980	0.0116
8	2	7	7	2	6	8	7	/E	25273.2740	-0.0411
8	2	7	7	2	6	7	6	/E	25273.3740	-0.0012
8	2	7	7	2	6	9	8	/E	25273.3740	-0.0015
8	2	7	7	2	6	8	7	/A	25273.5500	0.0370
8	2	7	7	2	6	9	8	/A	25273.5500	-0.0233
8	2	7	7	2	6	7	6	/A	25273.5500	-0.0231
4	2	2	3	1	3	3	2	/E	25299.6380	0.0099
4	2	2	3	1	3	5	4	/E	25299.9170	-0.0008
4	2	2	3	1	3	5	4	/A	25300.8600	-0.0232
4	2	2	3	1	3	4	3	/A	25301.7480	0.0177
9	0	9	8	1	8	8	7	/E	25993.5140	0.0196
9	0	9	8	1	8	10	9	/E	25993.5140	0.0065
9	0	9	8	1	8	9	8	/E	25993.5140	0.0234
9	0	9	8	1	8	9	8	/A	25993.5170	-0.0058
9	0	9	8	1	8	10	9	/A	25993.5170	-0.0227
9	0	9	8	1	8	8	7	/A	25993.5170	-0.0096
25	3	23	24	3	22	26	25	/E	75720.7923	0.0109
25	3	23	24	3	22	25	24	/E	75720.7923	0.0365
25	3	23	24	3	22	24	23	/E	75720.7923	0.0112
25	3	23	24	3	22	24	23	/A	75721.6211	-0.0080
25	3	23	24	3	22	26	25	/A	75721.6211	-0.0083
25	3	23	24	3	22	25	24	/A	75721.6211	0.0173
24	3	21	23	3	20	23	22	/E	75824.4703	0.0351
24	3	21	23	3	20	24	23	/E	75824.4703	0.0804
24	3	21	23	3	20	25	24	/E	75824.4703	0.0361
24	3	21	23	3	20	24	23	/A	75825.7663	0.0136
24	3	21	23	3	20	23	22	/A	75825.7663	-0.0317
24	3	21	23	3	20	25	24	/A	75825.7663	-0.0307
27	0	27	26	0	26	28	27	/A	76009.1742	0.0050
27	1	27	26	1	26	27	26	/A	76009.1742	0.0118
27	1	27	26	1	26	26	25	/A	76009.1742	0.0082
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27	0	27	26	0	26	27	26	/A	76009.1742	0.0103
27	0	27	26	0	26	26	25	/A	76009.1742	0.0067
26	3	24	25	3	23	27	26	/E	78483.2605	0.1093

26	3	24	25	3	23	26	25	/E	78483.2605	0.1331
26	3	24	25	3	23	25	24	/E	78483.2605	0.1097
26	3	24	25	3	23	25	24	/A	78484.0109	0.0130
26	3	24	25	3	23	26	25	/A	78484.0109	0.0364
26	3	24	25	3	23	27	26	/A	78484.0109	0.0126
26	2	24	25	2	23	27	26	/E	78488.7812	-0.0424
26	2	24	25	2	23	26	25	/E	78488.7812	-0.0184
26	2	24	25	2	23	25	24	/E	78488.7812	-0.0420
26	2	24	25	2	23	25	24	/A	78489.7064	0.0287
26	2	24	25	2	23	27	26	/A	78489.7064	0.0284
26	2	24	25	2	23	26	25	/A	78489.7064	0.0524
25	3	22	24	3	21	26	25	/A	78522.2573	0.0445
25	3	22	24	3	21	24	23	/A	78522.2573	0.0439
25	3	22	24	3	21	25	24	/A	78522.2573	0.0838
28	0	28	27	0	27	28	27	/E	78774.3861	-0.0047
28	0	28	27	0	27	27	26	/E	78774.3861	-0.0080
28	1	28	27	1	27	28	27	/E	78774.3861	-0.0039
28	0	28	27	0	27	29	28	/E	78774.3861	-0.0096
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28	1	28	27	1	27	29	28	/E	78774.3861	-0.0088
26	3	23	25	3	22	27	26	/E	81236.9594	0.0345
26	3	23	25	3	22	25	24	/E	81236.9594	0.0341
26	3	23	25	3	22	26	25	/E	81236.9594	0.0698
26	3	23	25	3	22	25	24	/A	81238.1765	-0.0237
26	3	23	25	3	22	27	26	/A	81238.1765	-0.0232
26	3	23	25	3	22	26	25	/A	81238.1765	0.0121
28	2	27	27	2	26	29	28	/E	81380.8588	0.0589
28	2	27	27	2	26	28	27	/E	81380.8588	0.0717
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28	2	27	27	2	26	28	27	/A	81381.3023	0.0129
28	1	27	27	1	26	28	27	/A	81381.3023	-0.0440
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28	1	27	27	1	26	27	26	/A	81381.3023	-0.0559
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29	1	29	28	1	28	30	29	/E	81539.6568	0.0269
29	1	29	28	1	28	30	29	/A	81539.6568	-0.1346
29	0	29	28	0	28	28	27	/A	81539.6568	-0.1335
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29	1	29	28	1	28	30	29	/E	81539.6568	0.0269
29	1	29	28	1	28	30	29	/A	81539.6568	-0.1346
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27	4	24	26	4	23	26	25	/E	83912.7562	-0.1141
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27	4	24	26	4	23	27	26	/A	83914.0601	0.0372
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27	4	24	26	4	23	28	27	/A	83914.0601	0.0074
28	3	26	27	3	25	29	28	/E	84007.2979	-0.0336
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29	1	28	28	1	27	28	27	/E	84145.3240	-0.0386
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29	2	28	28	2	27	30	29	/E	84145.3240	-0.0095
29	1	28	28	1	27	30	29	/E	84145.3240	-0.0396
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29	2	28	28	2	27	30	29	/A	84145.7440	-0.0910
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30	1	30	29	1	29	30	29	/A	84304.8716	0.0111
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30	1	30	29	1	29	29	28	/A	84304.8716	0.0082
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28	4	25	27	4	24	28	27	/E	86673.8478	0.1082
28	4	25	27	4	24	27	26	/E	86673.8478	0.0800
28	4	25	27	4	24	29	28	/E	86673.8478	0.0801
29	3	27	28	3	26	28	27	/E	86769.4525	0.0091
29	3	27	28	3	26	30	29	/E	86769.4525	0.0087
29	3	27	28	3	26	29	28	/E	86769.4525	0.0279
29	3	27	28	3	26	28	27	/A	86770.2997	0.0146
29	2	27	28	2	26	30	29	/E	86770.2997	-0.1492
29	2	27	28	2	26	29	28	/E	86770.2997	-0.1299
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29	2	27	28	2	26	28	27	/E	86770.2997	-0.1487
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29	2	27	28	2	26	30	29	/A	86771.3352	0.0431
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31	1	31	30	1	30	31	30	/A	87069.8595	0.0929
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29	4	26	28	4	25	28	27	/E	89432.6829	-0.0487
29	4	26	28	4	25	29	28	/E	89432.6829	-0.0223
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29	4	26	28	4	25	28	27	/A	89433.9368	0.0196
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29	3	26	28	3	25	28	27	/E	89451.8196	-0.1149
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29	3	26	28	3	25	29	28	/A	89453.0920	-0.0263
29	3	26	28	3	25	28	27	/A	89453.0920	-0.0535
29	3	26	28	3	25	30	29	/A	89453.0920	-0.0534
31	2	30	30	2	29	31	30	/E	89674.0475	-0.0222
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31	1	30	30	1	29	31	30	/A	89674.4750	-0.1028
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30	4	27	29	4	26	31	30	/E	92190.7018	-0.1036
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30	3	27	29	3	26	30	29	/A	92203.2747	0.0240
31	2	29	30	2	28	31	30	/E	92294.3600	0.1704
31	2	29	30	2	28	30	29	/E	92294.3600	0.1539
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32	1	31	31	1	30	31	30	/E	92438.3183	0.0488
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32	1	31	31	1	30	33	32	/A	92438.6990	-0.0702
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33	1	33	32	1	32	32	31	/A	92599.0355	-0.0168
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33	0	33	32	0	32	32	31	/A	92599.0355	-0.0168
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31	3	28	30	3	27	30	29	/E	94955.1598	-0.0001
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33	2	32	32	2	31	33	32	/E	95202.3593	0.0591
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33	1	32	32	1	31	32	31	/A	95202.7871	-0.0220
33	1	32	32	1	31	34	33	/A	95202.7871	-0.0228
33	1	32	32	1	31	33	32	/A	95202.7871	-0.0135
33	2	32	32	2	31	32	31	/A	95202.7871	-0.0197

33	2	32	32	2	31	33	32	/A	95202.7871	-0.0112
33	2	32	32	2	31	34	33	/A	95202.7871	-0.0205
32	4	29	31	4	28	31	30	/E	97706.4458	-0.0300
32	4	29	31	4	28	32	31	/E	97706.4458	-0.0082
32	4	29	31	4	28	33	32	/E	97706.4458	-0.0300
32	4	29	31	4	28	32	31	/A	97707.7052	0.0735
32	4	29	31	4	28	33	32	/A	97707.7052	0.0517
32	4	29	31	4	28	31	30	/A	97707.7052	0.0517
32	3	29	31	3	28	33	32	/A	97711.4391	0.0028
32	3	29	31	3	28	31	30	/A	97711.4391	0.0029
32	3	29	31	3	28	32	31	/A	97711.4391	0.0248
33	3	31	32	3	30	32	31	/E	97818.4657	-0.1056
33	3	31	32	3	30	34	33	/E	97818.4657	-0.1061
33	3	31	32	3	30	33	32	/E	97818.4657	-0.0911
33	2	31	32	2	30	34	33	/A	97819.4395	-0.0577
33	2	31	32	2	30	32	31	/A	97819.4395	-0.0573
33	3	31	32	3	30	33	32	/A	97819.4395	0.0488
33	3	31	32	3	30	32	31	/A	97819.4395	0.0343
33	3	31	32	3	30	34	33	/A	97819.4395	0.0338
33	2	31	32	2	30	33	32	/A	97819.4395	-0.0427
34	1	33	33	1	32	34	33	/E	97966.1612	-0.0306
34	1	33	33	1	32	33	32	/E	97966.1612	-0.0386
34	2	33	33	2	32	33	32	/E	97966.1612	-0.0374
34	1	33	33	1	32	35	34	/E	97966.1612	-0.0394
34	2	33	33	2	32	34	33	/E	97966.1612	-0.0294
34	2	33	33	2	32	35	34	/E	97966.1612	-0.0382
34	1	33	33	1	32	34	33	/A	97966.6952	0.0061
34	1	33	33	1	32	33	32	/A	97966.6952	-0.0019
34	1	33	33	1	32	35	34	/A	97966.6952	-0.0027
34	2	33	33	2	32	33	32	/A	97966.6952	-0.0007
34	2	33	33	2	32	35	34	/A	97966.6952	-0.0015
34	2	33	33	2	32	34	33	/A	97966.6952	0.0073
35	1	35	34	1	34	36	35	/A	98127.6673	0.0772
35	0	35	34	0	34	35	34	/A	98127.6673	0.0804
35	1	35	34	1	34	35	34	/A	98127.6673	0.0804
35	0	35	34	0	34	34	33	/A	98127.6673	0.0782
35	1	35	34	1	34	34	33	/A	98127.6673	0.0782
35	0	35	34	0	34	36	35	/A	98127.6673	0.0772
33	4	30	32	4	29	32	31	/E	100464.5612	-0.0139
33	4	30	32	4	29	34	33	/E	100464.5612	-0.0140
33	4	30	32	4	29	33	32	/E	100464.5612	0.0066
33	4	30	32	4	29	34	33	/A	100465.8635	0.1141
33	4	30	32	4	29	32	31	/A	100465.8635	0.1142
33	4	30	32	4	29	33	32	/A	100465.8635	0.1347
33	3	30	32	3	29	34	33	/E	100466.8182	0.0827
33	3	30	32	3	29	33	32	/E	100466.8182	0.1034
33	3	30	32	3	29	32	31	/E	100466.8182	0.0828
34	2	32	33	2	31	33	32	/E	100580.9286	-0.0419

34	3	32	33	3	31	35	34	/E	100580.9286	0.0073
34	2	32	33	2	31	35	34	/E	100580.9286	-0.0423
34	2	32	33	2	31	34	33	/E	100580.9286	-0.0282
34	3	32	33	3	31	33	32	/E	100580.9286	0.0077
34	3	32	33	3	31	34	33	/E	100580.9286	0.0214
34	3	32	33	3	31	33	32	/A	100581.7873	0.0344
34	2	32	33	2	31	34	33	/A	100581.7873	-0.0016
34	2	32	33	2	31	35	34	/A	100581.7873	-0.0157
34	3	32	33	3	31	35	34	/A	100581.7873	0.0339
34	3	32	33	3	31	34	33	/A	100581.7873	0.0481
34	2	32	33	2	31	33	32	/A	100581.7873	-0.0153
35	1	34	34	1	33	35	34	/A	100730.3471	-0.0666
35	2	34	34	2	33	34	33	/A	100730.3471	-0.0735
35	2	34	34	2	33	36	35	/A	100730.3471	-0.0743
35	2	34	34	2	33	35	34	/A	100730.3471	-0.0659
35	1	34	34	1	33	36	35	/A	100730.3471	-0.0749
35	1	34	34	1	33	34	33	/A	100730.3471	-0.0741
34	4	31	33	4	30	34	33	/E	103222.9175	-0.0284
34	4	31	33	4	30	35	34	/E	103222.9175	-0.0478
34	4	31	33	4	30	33	32	/E	103222.9175	-0.0477
34	4	31	33	4	30	33	32	/A	103224.1269	-0.0087
34	3	31	33	3	30	35	34	/E	103224.1269	-0.0653
34	4	31	33	4	30	35	34	/A	103224.1269	-0.0088
34	3	31	33	3	30	34	33	/E	103224.1269	-0.0458
34	4	31	33	4	30	34	33	/A	103224.1269	0.0106
34	3	31	33	3	30	33	32	/E	103224.1269	-0.0651
34	3	31	33	3	30	34	33	/A	103225.3543	0.0093
34	3	31	33	3	30	35	34	/A	103225.3543	-0.0102
34	3	31	33	3	30	33	32	/A	103225.3543	-0.0101
35	2	33	34	2	32	34	33	/E	103343.2397	-0.0284
35	2	33	34	2	32	35	34	/E	103343.2397	-0.0155
35	2	33	34	2	32	36	35	/E	103343.2397	-0.0289
35	3	33	34	3	32	35	34	/E	103343.2397	0.0112
35	3	33	34	3	32	36	35	/E	103343.2397	-0.0021
35	3	33	34	3	32	34	33	/E	103343.2397	-0.0017
35	2	33	34	2	32	35	34	/A	103344.1086	0.0230
35	3	33	34	3	32	35	34	/A	103344.1086	0.0498
35	3	33	34	3	32	36	35	/A	103344.1086	0.0365
35	2	33	34	2	32	34	33	/A	103344.1086	0.0101
35	2	33	34	2	32	36	35	/A	103344.1086	0.0097
35	3	33	34	3	32	34	33	/A	103344.1086	0.0369
36	2	35	35	2	34	35	34	/E	103493.5608	0.0856
36	1	35	35	1	34	35	34	/E	103493.5608	0.0853
36	2	35	35	2	34	37	36	/E	103493.5608	0.0849
36	1	35	35	1	34	37	36	/E	103493.5608	0.0846
36	1	35	35	1	34	36	35	/E	103493.5608	0.0925
36	2	35	35	2	34	36	35	/E	103493.5608	0.0928
37	0	37	36	0	36	36	35	/E	103655.1412	-0.0311

37	1	37	36	1	36	37	36	/E	103655.1412	-0.0292
37	1	37	36	1	36	38	37	/E	103655.1412	-0.0321
37	0	37	36	0	36	37	36	/E	103655.1412	-0.0292
37	1	37	36	1	36	36	35	/E	103655.1412	-0.0311
37	0	37	36	0	36	38	37	/E	103655.1412	-0.0321
35	4	32	34	4	31	34	33	/E	105981.5603	-0.0865
35	4	32	34	4	31	36	35	/E	105981.5603	-0.0866
35	4	32	34	4	31	35	34	/E	105981.5603	-0.0683
35	3	32	34	3	31	36	35	/E	105982.3544	0.0152
35	3	32	34	3	31	35	34	/E	105982.3544	0.0336
35	3	32	34	3	31	34	33	/E	105982.3544	0.0154
35	3	32	34	3	31	35	34	/A	105983.4936	0.0049
35	3	32	34	3	31	36	35	/A	105983.4936	-0.0134
35	3	32	34	3	31	34	33	/A	105983.4936	-0.0133
36	3	34	35	3	33	35	34	/E	106105.4763	-0.0299
36	2	34	35	2	33	36	35	/E	106105.4763	-0.0321
36	2	34	35	2	33	35	34	/E	106105.4763	-0.0443
36	2	34	35	2	33	37	36	/E	106105.4763	-0.0447
36	3	34	35	3	33	37	36	/E	106105.4763	-0.0303
36	3	34	35	3	33	36	35	/E	106105.4763	-0.0177
36	3	34	35	3	33	37	36	/A	106106.3447	0.0096
36	2	34	35	2	33	35	34	/A	106106.3447	-0.0044
36	2	34	35	2	33	36	35	/A	106106.3447	0.0078
36	2	34	35	2	33	37	36	/A	106106.3447	-0.0048
36	3	34	35	3	33	36	35	/A	106106.3447	0.0222
36	3	34	35	3	33	35	34	/A	106106.3447	0.0100
37	2	36	36	2	35	36	35	/E	106256.8350	-0.0074
37	1	36	36	1	35	38	37	/E	106256.8350	-0.0082
37	2	36	36	2	35	37	36	/E	106256.8350	-0.0006
37	1	36	36	1	35	36	35	/E	106256.8350	-0.0076
37	1	36	36	1	35	37	36	/E	106256.8350	-0.0008
37	2	36	36	2	35	38	37	/E	106256.8350	-0.0081
37	2	36	36	2	35	38	37	/A	106257.4224	0.0844
37	2	36	36	2	35	36	35	/A	106257.4224	0.0851
37	1	36	36	1	35	37	36	/A	106257.4224	0.0918
37	1	36	36	1	35	38	37	/A	106257.4224	0.0843
37	1	36	36	1	35	36	35	/A	106257.4224	0.0850
37	2	36	36	2	35	37	36	/A	106257.4224	0.0919
38	0	38	37	0	37	39	38	/E	106418.8190	0.0878
38	0	38	37	0	37	39	38	/A	106418.8190	-0.0700
38	1	38	37	1	37	38	37	/A	106418.8190	-0.0673
38	0	38	37	0	37	38	37	/A	106418.8190	-0.0673
38	1	38	37	1	37	38	37	/E	106418.8190	0.0905
38	1	38	37	1	37	39	38	/E	106418.8190	0.0878
38	1	38	37	1	37	39	38	/A	106418.8190	-0.0700
38	1	38	37	1	37	37	36	/A	106418.8190	-0.0691
38	1	38	37	1	37	37	36	/E	106418.8190	0.0887
38	0	38	37	0	37	38	37	/E	106418.8190	0.0905

38	0	38	37	0	37	37	36	/A	106418.8190	-0.0691
38	0	38	37	0	37	37	36	/E	106418.8190	0.0887
37	3	35	36	3	34	37	36	/E	108867.6425	-0.0369
37	2	35	36	2	34	38	37	/E	108867.6425	-0.0566
37	3	35	36	3	34	38	37	/E	108867.6425	-0.0489
37	2	35	36	2	34	37	36	/E	108867.6425	-0.0446
37	3	35	36	3	34	36	35	/E	108867.6425	-0.0485
37	2	35	36	2	34	36	35	/E	108867.6425	-0.0562
37	2	35	36	2	34	38	37	/A	108868.5521	0.0261
37	3	35	36	3	34	37	36	/A	108868.5521	0.0458
37	3	35	36	3	34	38	37	/A	108868.5521	0.0339
37	2	35	36	2	34	36	35	/A	108868.5521	0.0266
37	3	35	36	3	34	36	35	/A	108868.5521	0.0343
37	2	35	36	2	34	37	36	/A	108868.5521	0.0381
38	1	37	37	1	36	39	38	/E	109020.1184	0.1009
38	2	37	37	2	36	39	38	/E	109020.1184	0.1009
38	1	37	37	1	36	38	37	/E	109020.1184	0.1080
38	1	37	37	1	36	37	36	/E	109020.1184	0.1015
38	2	37	37	2	36	38	37	/E	109020.1184	0.1080
38	2	37	37	2	36	37	36	/E	109020.1184	0.1016
38	2	37	37	2	36	37	36	/A	109020.5272	0.0162
38	1	37	37	1	36	38	37	/A	109020.5272	0.0226
38	2	37	37	2	36	38	37	/A	109020.5272	0.0227
38	1	37	37	1	36	39	38	/A	109020.5272	0.0155
38	2	37	37	2	36	39	38	/A	109020.5272	0.0156
38	1	37	37	1	36	37	36	/A	109020.5272	0.0162
39	0	39	38	0	38	38	37	/E	109182.0446	-0.0269
39	1	39	38	1	38	38	37	/E	109182.0446	-0.0269
39	1	39	38	1	38	40	39	/E	109182.0446	-0.0277
39	1	39	38	1	38	39	38	/E	109182.0446	-0.0252
39	0	39	38	0	38	39	38	/E	109182.0446	-0.0252
39	0	39	38	0	38	40	39	/E	109182.0446	-0.0277

1.2.10 MCA_2 XIAM line list in the frequency range of 2-110 GHz.

Table S10: Measured frequencies and residuals (in MHz) for the rotational transitions of MCA_2 in the frequency range of 2-110 GHz using XIAM.

J	Ka	Kc	J'	Ka'	Kc'	F	F'		Observed Freq (MHz)	Residuals (MHz)
5	1	4	5	1	5	4	4	/A	2454.6871	0.0096
5	1	4	5	1	5	6	6	/A	2454.7730	0.0180
5	1	4	5	1	5	4	4	/E	2454.9662	-0.0193
5	1	4	5	1	5	6	6	/E	2455.0425	-0.0205
5	1	4	5	1	5	5	5	/A	2455.1584	0.0228
5	1	4	5	1	5	5	5	/E	2455.4334	-0.0101
1	0	1	0	0	0	1	1	/E	2662.6395	0.0041
1	0	1	0	0	0	1	1	/A	2662.6395	-0.0104
1	0	1	0	0	0	2	1	/A	2663.5170	-0.0198
1	0	1	0	0	0	2	1	/E	2663.5170	-0.0054
1	0	1	0	0	0	0	1	/A	2664.8620	-0.0053
1	0	1	0	0	0	0	1	/E	2664.8620	0.0092
1	1	1	2	0	2	0	1	/E	2685.4328	-0.0049
1	1	1	2	0	2	1	1	/E	2686.1369	-0.0153
1	1	1	2	0	2	2	3	/E	2686.3754	-0.0209
1	1	1	2	0	2	1	2	/E	2687.6190	-0.0168
1	1	1	2	0	2	0	1	/A	2691.6025	-0.0053
1	1	1	2	0	2	1	1	/A	2692.2967	-0.0072
1	1	1	2	0	2	2	3	/A	2692.5546	-0.0007
1	1	1	2	0	2	2	2	/A	2693.5105	0.0015
1	1	1	2	0	2	1	2	/A	2693.7875	0.0000
4	0	4	3	1	3	3	2	/A	3009.9837	-0.0226
4	0	4	3	1	3	4	3	/A	3009.9837	0.0182
4	0	4	3	1	3	5	4	/A	3010.0750	0.0088
4	0	4	3	1	3	4	3	/E	3012.9213	0.0196
4	0	4	3	1	3	3	2	/E	3012.9213	-0.0215
4	0	4	3	1	3	5	4	/E	3013.0119	0.0093
6	2	5	7	1	6	7	8	/A	3415.0832	-0.0024
6	2	5	7	1	6	5	6	/A	3415.0832	-0.0117
6	2	5	7	1	6	6	7	/A	3415.1313	-0.0165
7	1	6	7	1	7	6	6	/E	4578.3413	-0.0191
7	1	6	7	1	7	6	6	/A	4578.4992	0.0214
7	1	6	7	1	7	8	8	/E	4578.5011	0.0849
7	1	6	7	1	7	8	8	/A	4578.5625	0.0289
7	1	6	7	1	7	7	7	/E	4578.7562	-0.0471
7	1	6	7	1	7	7	7	/A	4578.9514	0.0306
2	1	2	1	1	1	2	1	/A	5162.3324	-0.0019
2	1	2	1	1	1	2	2	/A	5162.6095	-0.0033
2	1	2	1	1	1	3	2	/A	5163.2702	0.0054
2	1	2	1	1	1	1	1	/A	5163.3500	0.0015
2	1	2	1	1	1	1	0	/A	5164.0490	0.0044
2	1	2	1	1	1	2	1	/E	5164.7991	-0.0223
2	1	2	1	1	1	2	2	/E	5165.1107	0.0036

2	1	2	1	1	1	3	2	/E	5165.7630	0.0048
2	1	2	1	1	1	1	1	/E	5165.8580	0.0239
2	1	2	1	1	1	1	0	/E	5166.5473	-0.0012
2	0	2	1	0	1	2	2	/E	5323.3708	-0.0036
2	0	2	1	0	1	2	2	/A	5323.4097	0.0061
2	0	2	1	0	1	1	0	/E	5323.5226	-0.0050
2	0	2	1	0	1	1	0	/A	5323.5521	-0.0047
2	0	2	1	0	1	2	1	/E	5324.2586	-0.0028
2	0	2	1	0	1	2	1	/A	5324.3174	0.0268
2	0	2	1	0	1	3	2	/E	5324.3652	0.0371
2	0	2	1	0	1	3	2	/A	5324.3665	0.0091
2	0	2	1	0	1	1	1	/E	5325.7538	0.0089
2	0	2	1	0	1	1	1	/A	5325.7553	-0.0189
2	1	1	1	1	0	2	1	/E	5487.1812	-0.0170
2	1	1	1	1	0	1	1	/E	5487.6373	-0.0264
2	1	1	1	1	0	3	2	/E	5488.0974	-0.0012
2	1	1	1	1	0	1	0	/E	5489.1712	0.0046
2	1	1	1	1	0	2	1	/A	5489.7401	-0.0003
2	1	1	1	1	0	1	1	/A	5490.2013	-0.0032
2	1	1	1	1	0	2	2	/A	5490.3536	0.0047
2	1	1	1	1	0	3	2	/A	5490.6543	0.0071
2	1	1	1	1	0	1	0	/A	5491.7355	0.0098
5	0	5	4	1	4	4	3	/A	5956.2265	0.0542
5	0	5	4	1	4	6	5	/A	5956.2265	-0.0013
5	0	5	4	1	4	6	5	/E	5958.8569	0.0011
5	0	5	4	1	4	4	3	/E	5958.8569	0.0566
5	2	4	6	1	5	4	5	/A	6628.3842	-0.0045
5	2	4	6	1	5	6	7	/A	6628.3842	-0.0100
5	2	4	6	1	5	5	6	/A	6628.5445	-0.0101
3	1	3	2	1	2	3	3	/A	7742.2270	0.0007
3	1	3	2	1	2	3	3	/E	7742.8866	0.0360
3	1	3	2	1	2	3	2	/A	7742.8866	0.0083
3	1	3	2	1	2	2	1	/A	7743.1559	0.0450
3	1	3	2	1	2	4	3	/A	7743.1570	0.0071
3	1	3	2	1	2	3	2	/E	7743.5123	0.0106
3	1	3	2	1	2	4	3	/E	7743.7802	0.0062
3	1	3	2	1	2	2	1	/E	7743.7802	0.0447
3	1	3	2	1	2	2	2	/A	7744.1375	0.0124
3	1	3	2	1	2	2	2	/E	7744.7631	0.0149
3	0	3	2	0	2	3	3	/E	7979.2404	0.0108
3	0	3	2	0	2	3	3	/A	7979.2409	-0.0332
3	0	3	2	0	2	2	1	/E	7980.0608	0.0187
3	0	3	2	0	2	2	1	/A	7980.0615	-0.0251
3	0	3	2	0	2	4	3	/E	7980.2298	0.0058
3	0	3	2	0	2	3	2	/E	7980.2298	0.0465
3	0	3	2	0	2	3	2	/A	7980.2309	0.0031
3	0	3	2	0	2	4	3	/A	7980.2309	-0.0376
3	0	3	2	0	2	2	2	/E	7981.5431	0.0174

3	0	3	2	0	2	2	2	/A	7981.5455	-0.0247
3	2	2	2	2	1	3	2	/A	7989.4359	0.0104
3	2	2	2	2	1	4	3	/A	7990.3869	0.0111
3	2	2	2	2	1	2	1	/A	7990.9194	0.0157
3	2	2	2	2	1	3	2	/E	7993.9762	-0.0175
3	2	1	2	2	0	3	2	/E	7994.7234	0.0211
3	2	2	2	2	1	4	3	/E	7994.9555	0.0137
3	2	2	2	2	1	2	1	/E	7995.4770	0.0077
3	2	1	2	2	0	4	3	/E	7995.6618	0.0124
3	2	1	2	2	0	2	1	/E	7996.1882	0.0116
3	2	1	2	2	0	3	2	/A	7999.3446	-0.0067
3	2	1	2	2	0	4	3	/A	8000.2960	-0.0001
3	2	1	2	2	0	2	1	/A	8000.8164	-0.0065
1	1	0	1	0	1	1	0	/A	8179.8370	-0.0022
1	1	0	1	0	1	0	1	/A	8180.5640	0.0287
1	1	0	1	0	1	2	2	/A	8180.5640	0.0029
1	1	0	1	0	1	1	2	/A	8181.1600	-0.0097
1	1	0	1	0	1	2	1	/A	8181.4370	-0.0111
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3	1	2	2	1	1	4	3	/E	8233.5040	-0.0086
3	1	2	2	1	1	2	1	/E	8233.5533	0.0120
3	1	2	2	1	1	3	2	/A	8233.9600	-0.0014
3	1	2	2	1	1	2	2	/E	8233.9643	-0.0425
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3	1	2	2	1	1	2	1	/A	8234.2020	-0.0471
3	1	2	2	1	1	2	2	/A	8234.7140	0.0008
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2	1	1	2	0	2	3	3	/E	8345.7167	-0.0108
2	1	1	2	0	2	2	1	/A	8346.0220	-0.0008
2	1	1	2	0	2	2	2	/E	8346.3799	-0.0021
2	1	1	2	0	2	1	1	/A	8346.5000	0.0131
2	1	1	2	0	2	3	3	/A	8346.8510	0.0000
2	1	1	2	0	2	2	2	/A	8347.5120	0.0056
2	1	1	2	0	2	3	2	/A	8347.8070	0.0022
2	1	1	2	0	2	1	2	/A	8347.9710	0.0005
3	1	2	3	0	3	3	2	/E	8598.0980	-0.0130
3	1	2	3	0	3	3	4	/E	8598.4810	0.0220
3	1	2	3	0	3	2	2	/E	8598.8589	-0.0042
3	1	2	3	0	3	4	4	/E	8599.0130	-0.0031
3	1	2	3	0	3	3	3	/E	8599.4518	-0.0016
3	1	2	3	0	3	2	3	/E	8600.2130	0.0075
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3	1	2	3	0	3	3	3	/A	8601.2400	0.0000
3	1	2	3	0	3	4	3	/A	8601.8020	0.0051
3	1	2	3	0	3	2	3	/A	8602.0000	0.0082
4	1	3	4	0	4	3	3	/E	8945.7967	-0.0140
4	1	3	4	0	4	5	5	/E	8945.8880	-0.0132
4	1	3	4	0	4	4	4	/E	8946.2385	-0.0147
4	1	3	4	0	4	4	3	/A	8947.0540	0.0198
4	1	3	4	0	4	4	5	/A	8947.3000	0.0024
4	1	3	4	0	4	3	3	/A	8947.8620	-0.0171
4	1	3	4	0	4	5	5	/A	8947.9810	0.0113
4	1	3	4	0	4	4	4	/A	8948.3220	0.0002
4	1	3	4	0	4	5	4	/A	8948.9950	0.0011
4	1	3	4	0	4	3	4	/A	8949.1690	0.0023
6	0	6	5	1	5	6	5	/A	8953.2580	0.0286
6	0	6	5	1	5	7	6	/A	8953.2580	0.0734
6	0	6	5	1	5	5	4	/A	8953.2580	0.1199
6	0	6	5	1	5	5	4	/E	8955.6072	0.0310
6	0	6	5	1	5	6	5	/E	8955.6072	-0.0602
6	0	6	5	1	5	7	6	/E	8955.6072	-0.0155
5	1	4	5	0	5	6	6	/E	9393.3205	-0.0345
5	1	4	5	0	5	4	4	/E	9393.3205	0.0293
5	1	4	5	0	5	5	5	/E	9393.6497	-0.0184
5	1	4	5	0	5	5	6	/A	9394.8430	-0.0020
5	1	4	5	0	5	4	4	/A	9395.5590	0.0418
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5	1	4	5	0	5	6	5	/A	9396.6320	0.0019
5	1	4	5	0	5	4	5	/A	9396.7730	-0.0070
4	2	3	5	1	4	3	4	/A	9767.7860	0.0654
4	2	3	5	1	4	5	6	/A	9767.7860	0.0194
4	2	3	5	1	4	4	5	/A	9768.1160	0.0175
6	1	5	6	0	6	5	5	/E	9949.9599	-0.0478
6	1	5	6	0	6	7	7	/E	9950.0329	-0.0246
6	1	5	6	0	6	6	6	/E	9950.3164	-0.0362
6	1	5	6	0	6	7	7	/A	9952.3970	0.0072
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5	2	3	6	1	6	4	5	/A	10150.6130	0.0431
5	2	3	6	1	6	6	7	/A	10150.6300	-0.0156
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4	0	4	3	0	3	4	4	/E	10627.7170	0.0341
4	0	4	3	0	3	4	4	/A	10627.7170	-0.0264
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4	2	3	3	2	2	3	2	/A	10651.8250	0.0058
4	2	2	3	2	1	4	3	/E	10666.5635	-0.0200
4	2	2	3	2	1	3	2	/E	10666.9975	-0.0868
4	2	2	3	2	1	5	4	/E	10666.9975	0.0160
1	1	1	0	0	0	0	1	/E	10673.8196	0.0015
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4	2	2	3	2	1	4	3	/A	10676.1170	0.0213
4	2	2	3	2	1	5	4	/A	10676.4890	-0.0033
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4	1	3	3	1	2	4	3	/E	10975.4553	-0.0218
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4	1	3	3	1	2	3	2	/A	10975.9100	-0.0027
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8	1	7	8	0	8	7	7	/E	11431.7735	-0.0356
8	1	7	8	0	8	9	9	/E	11431.8502	0.0049
8	1	7	8	0	8	8	8	/E	11432.1055	-0.0272
8	1	7	8	0	8	9	9	/A	11434.3540	0.0246
8	1	7	8	0	8	7	7	/A	11434.3540	0.0608
8	1	7	8	0	8	8	8	/A	11434.6160	-0.0009
7	0	7	6	1	6	6	5	/A	11989.5983	-0.0304
7	0	7	6	1	6	7	6	/A	11989.7105	-0.0242
7	0	7	6	1	6	8	7	/A	11989.7105	0.0434
7	0	7	6	1	6	6	5	/E	11991.8776	-0.0429
7	0	7	6	1	6	8	7	/E	11991.9976	0.0388
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9	1	8	9	0	9	10	10	/E	12378.5322	-0.0744
9	1	8	9	0	9	8	8	/E	12378.5322	-0.0419
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9	1	8	9	0	9	8	8	/A	12381.1610	0.0387
9	1	8	9	0	9	10	10	/A	12381.1610	0.0063
9	1	8	9	0	9	9	9	/A	12381.4630	0.0175
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2	1	2	1	0	1	2	2	/E	13175.8293	-0.0022
2	1	2	1	0	1	3	2	/E	13176.4850	0.0024
2	1	2	1	0	1	2	1	/E	13176.7208	0.0023
2	1	2	1	0	1	1	1	/E	13177.7376	0.0064
2	1	2	1	0	1	1	0	/A	13179.2100	0.0008
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2	1	2	1	0	1	3	2	/A	13180.1750	-0.0024
2	1	2	1	0	1	2	1	/A	13180.4020	-0.0104
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5	0	5	4	0	4	5	5	/E	13266.3600	0.0454
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5	0	5	4	0	4	5	4	/E	13267.2870	-0.0519
5	0	5	4	0	4	4	3	/E	13267.2870	-0.0271
5	0	5	4	0	4	5	4	/A	13267.4490	0.0325
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5	0	5	4	0	4	6	5	/A	13267.4490	0.0076
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5	2	4	4	2	3	6	5	/A	13311.4540	0.0069
5	2	3	4	2	2	5	4	/E	13348.6504	-0.0146
5	2	3	4	2	2	6	5	/E	13348.8401	-0.0269
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8	0	8	7	1	7	7	6	/A	15053.1181	-0.0519
8	0	8	7	1	7	9	8	/A	15053.1952	-0.0064
8	0	8	7	1	7	8	7	/A	15053.3208	0.0416
8	0	8	7	1	7	7	6	/E	15055.2644	-0.0661

8	0	8	7	1	7	9	8	/E	15055.3519	-0.0102
8	0	8	7	1	7	8	7	/E	15055.4793	0.0396
3	1	3	2	0	2	3	3	/E	15595.0002	-0.0049
3	1	3	2	0	2	2	1	/E	15595.7129	-0.0088
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3	1	3	2	0	2	3	3	/A	15598.0240	-0.0223
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3	1	3	2	0	2	4	3	/A	15598.9640	-0.0059
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6	0	6	5	0	5	7	6	/E	15893.9430	0.0284
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6	2	5	5	2	4	6	5	/E	15978.3781	0.0076
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6	2	4	5	2	3	6	5	/E	16045.6819	0.0035
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6	2	4	5	2	3	6	5	/A	16055.2750	0.0615
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6	1	5	5	1	4	7	6	/E	16450.5981	-0.0191
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6	1	5	5	1	4	5	4	/A	16450.8050	0.0044
6	1	5	5	1	4	6	5	/A	16450.8050	0.0263
6	1	5	5	1	4	7	6	/A	16450.8050	-0.0144
4	1	4	3	0	3	4	3	/E	17937.1438	-0.0186
4	1	4	3	0	3	3	2	/E	17937.1438	0.0076
4	1	4	3	0	3	5	4	/E	17937.2498	0.0348
4	1	4	3	0	3	3	2	/A	17939.9145	0.0120
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7	1	7	6	1	6	7	6	/A	18039.5110	0.0261
7	1	7	6	1	6	8	7	/A	18039.5110	-0.0053
7	1	7	6	1	6	7	6	/E	18039.5110	0.0313
7	1	7	6	1	6	8	7	/E	18039.5110	-0.0001
7	1	7	6	1	6	6	5	/E	18039.5110	0.0239
7	1	7	6	1	6	6	5	/A	18039.5110	0.0187

9	0	9	8	1	8	8	7	/A	18130.5560	-0.0048
9	0	9	8	1	8	10	9	/A	18130.5560	-0.0309
9	0	9	8	1	8	8	7	/E	18132.5731	-0.0190
9	0	9	8	1	8	10	9	/E	18132.5731	-0.0452
7	0	7	6	0	6	7	7	/E	18505.1965	-0.0285
7	0	7	6	0	6	7	7	/A	18505.4084	0.0678
7	0	7	6	0	6	7	6	/E	18506.3800	0.0832
7	0	7	6	0	6	7	6	/A	18506.3800	-0.0324
7	0	7	6	0	6	6	5	/A	18506.3800	-0.0308
7	0	7	6	0	6	8	7	/A	18506.3800	-0.0541
7	0	7	6	0	6	6	5	/E	18506.3800	0.0848
7	0	7	6	0	6	8	7	/E	18506.3800	0.0616
7	0	7	6	0	6	6	6	/E	18507.5194	-0.0285
7	0	7	6	0	6	6	6	/A	18507.7313	0.0678
7	2	6	6	2	5	6	5	/A	18624.3390	0.0421
7	2	6	6	2	5	8	7	/A	18624.3390	0.0357
7	2	6	6	2	5	6	5	/E	18629.8274	0.0445
7	2	6	6	2	5	8	7	/E	18629.8274	0.0384
7	3	5	6	3	4	6	5	/A	18662.7920	-0.0371
7	3	5	6	3	4	8	7	/A	18662.7920	-0.0217
7	3	4	6	3	3	8	7	/E	18664.1930	-0.0036
7	3	4	6	3	3	6	5	/E	18664.1930	-0.0190
7	3	4	6	3	3	8	7	/A	18665.7490	-0.0208
7	3	4	6	3	3	6	5	/A	18665.7490	-0.0362
7	2	5	6	2	4	6	5	/E	18755.7426	0.0247
7	2	5	6	2	4	8	7	/E	18755.7426	0.0172
7	2	5	6	2	4	6	5	/A	18761.3990	0.0155
7	2	5	6	2	4	8	7	/A	18761.3990	0.0082
7	1	6	6	1	5	7	6	/A	19182.3310	-0.0674
7	1	6	6	1	5	6	5	/A	19182.3310	-0.0811
5	1	5	4	0	4	5	5	/E	20204.5378	-0.0014
5	1	5	4	0	4	6	5	/E	20205.7019	0.0462
5	1	5	4	0	4	4	3	/E	20205.7019	0.0822
5	1	5	4	0	4	5	5	/A	20207.1140	-0.0369
5	1	5	4	0	4	6	5	/A	20208.2930	0.0256
5	1	5	4	0	4	4	3	/A	20208.2930	0.0615
5	1	5	4	0	4	4	4	/A	20209.5350	0.0159
14	2	12	14	1	13	15	15	/E	20310.0038	-0.0048
14	2	12	14	1	13	14	14	/E	20310.0038	-0.0440
14	2	12	14	1	13	13	13	/E	20310.0038	-0.0019
14	2	12	14	1	13	14	14	/A	20315.4250	-0.0422
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13	2	11	13	1	12	12	12	/E	20362.3032	-0.0175
13	2	11	13	1	12	14	14	/E	20362.3032	-0.0194
13	2	11	13	1	12	13	13	/E	20362.3032	-0.0449
13	2	11	13	1	12	13	13	/A	20367.7420	-0.0380
13	2	11	13	1	12	14	14	/A	20367.7420	-0.0126

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8	1	8	7	1	7	9	8	/A	20605.3380	-0.0194
8	1	8	7	1	7	8	7	/E	20605.3380	0.0334
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8	1	8	7	1	7	7	6	/E	20605.3380	0.0285
8	1	8	7	1	7	7	6	/A	20605.3380	-0.0005
11	2	9	11	1	10	11	11	/E	20783.4092	-0.0235
11	2	9	11	1	10	12	12	/E	20783.4092	-0.0195
11	2	9	11	1	10	10	10	/E	20783.4092	-0.0191
11	2	9	11	1	10	12	12	/A	20788.5150	-0.0270
11	2	9	11	1	10	11	11	/A	20788.5150	-0.0311
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8	0	8	7	0	7	9	8	/E	21102.8965	-0.0179
8	0	8	7	0	7	8	7	/E	21102.8965	0.0035
8	0	8	7	0	7	7	6	/E	21102.8965	-0.0006
8	0	8	7	0	7	9	8	/A	21103.0840	0.0332
8	0	8	7	0	7	8	7	/A	21103.0840	0.0546
8	0	8	7	0	7	7	6	/A	21103.0840	0.0505
10	2	8	10	1	9	11	11	/E	21114.8727	0.0117
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10	2	8	10	1	9	9	9	/E	21114.8727	0.0116
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10	2	8	10	1	9	10	10	/A	21119.4980	-0.0024
10	2	8	10	1	9	11	11	/A	21119.4980	-0.0037
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10	0	10	9	1	9	11	10	/A	21208.4490	-0.0685
10	0	10	9	1	9	10	9	/A	21208.5960	0.0009
10	0	10	9	1	9	9	8	/E	21210.3370	-0.0570
10	0	10	9	1	9	11	10	/E	21210.3370	-0.0787
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8	2	7	7	2	6	9	8	/A	21276.5800	-0.0055
8	2	7	7	2	6	7	6	/A	21276.5800	0.0023
8	2	7	7	2	6	8	7	/A	21276.5800	0.0524
8	2	7	7	2	6	7	6	/E	21279.5287	0.0050
8	2	7	7	2	6	8	7	/E	21279.5287	0.0559
8	2	7	7	2	6	9	8	/E	21279.5287	-0.0027
8	3	6	7	3	5	7	6	/A	21333.7640	-0.0497
8	3	6	7	3	5	9	8	/A	21333.7640	-0.0450
8	3	6	7	3	5	7	6	/E	21336.4799	-0.0789
8	3	6	7	3	5	9	8	/E	21336.4799	-0.0742
8	3	5	7	3	4	7	6	/E	21336.7367	-0.0307
8	3	5	7	3	4	9	8	/E	21336.7367	-0.0261
8	3	5	7	3	4	7	6	/A	21339.6620	-0.0552
8	3	5	7	3	4	9	8	/A	21339.6620	-0.0507
8	2	6	7	2	5	9	8	/E	21477.1540	-0.0083
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9	2	7	9	1	8	10	10	/E	21500.0628	-0.0036
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8	2	6	8	1	7	7	7	/E	21918.4760	0.0202
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8	2	6	8	1	7	7	7	/A	21920.6390	0.0111
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7	2	5	7	1	6	8	8	/A	22349.3180	0.0024
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6	1	6	5	0	5	6	5	/A	22410.6040	-0.0616
6	1	6	5	0	5	5	4	/A	22410.8120	0.0521
6	1	6	5	0	5	7	6	/A	22410.8120	0.0344
6	2	4	6	1	5	6	6	/A	22770.3530	-0.0694
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9	1	9	8	1	8	9	8	/A	23167.1010	-0.0366
9	1	9	8	1	8	8	7	/A	23167.1010	-0.0404
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4	2	2	4	1	3	4	4	/A	23520.3020	0.0202
4	2	2	4	1	3	5	5	/E	23547.3592	-0.0060
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3	2	1	3	1	2	3	3	/A	23820.0230	0.0174
3	2	1	3	1	2	4	4	/E	23855.9465	-0.0294
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9	2	8	8	2	7	10	9	/A	23925.5240	-0.0323
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9	2	8	8	2	7	9	8	/A	23925.5240	0.0104
9	2	8	8	2	7	10	9	/E	23927.1188	-0.0279
9	2	8	8	2	7	8	7	/E	23927.1188	-0.0202
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9	3	7	8	3	6	10	9	/A	24006.3050	-0.0178
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9	3	6	8	3	5	10	9	/E	24012.1217	-0.0064
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2	2	0	2	1	1	1	1	/A	24052.6880	0.0199
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2	2	0	2	1	1	3	3	/E	24093.8306	-0.0084
2	2	0	2	1	1	2	3	/E	24094.6963	-0.0948
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2	2	0	2	1	1	2	2	/E	24095.0826	-0.0078
9	2	7	8	2	6	9	8	/E	24210.9320	0.0030
9	2	7	8	2	6	10	9	/E	24210.9320	-0.0236
9	2	7	8	2	6	8	7	/E	24210.9320	-0.0149
9	2	7	8	2	6	8	7	/A	24212.7620	-0.0007
9	2	7	8	2	6	9	8	/A	24212.7620	0.0176
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11	0	11	10	1	10	12	11	/A	24274.2650	-0.0393
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2	2	1	2	1	2	2	2	/E	24488.7495	0.0313
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7	1	7	6	0	6	7	6	/E	24553.8940	0.1440
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7	1	7	6	0	6	8	7	/E	24553.8940	0.0233
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7	1	7	6	0	6	7	6	/A	24556.2820	0.1194
9	1	8	8	1	7	8	7	/E	24629.3074	-0.0288
9	1	8	8	1	7	10	9	/E	24629.3074	-0.0385
9	1	8	8	1	7	9	8	/E	24629.3074	-0.0204
9	1	8	8	1	7	10	9	/A	24629.5000	-0.0680
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3	2	2	3	1	3	2	2	/E	24737.9658	0.0074
3	2	2	3	1	3	4	4	/E	24738.2969	0.0139
3	2	2	3	1	3	3	3	/E	24739.2260	0.0158
3	2	2	3	1	3	2	2	/A	24788.8370	0.0203
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4	2	3	4	1	4	5	5	/E	25077.8801	-0.0117
4	2	3	4	1	4	4	4	/E	25078.5624	0.0223
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10	1	10	9	1	9	9	8	/A	25724.6120	-0.0479
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28	5	24	27	5	23	29	28	/E	74954.5835	-0.0510
28	5	24	27	5	23	28	27	/E	74954.5835	-0.0451
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28	4	25	27	4	24	27	26	/A	75012.5096	0.0090
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28	4	25	27	4	24	28	27	/E	75013.8350	0.0791
28	4	24	27	4	23	28	27	/E	75416.7390	0.0387
28	4	24	27	4	23	27	26	/E	75416.7390	0.0421
28	4	24	27	4	23	29	28	/E	75416.7390	0.0407

28	4	24	27	4	23	27	26	/A	75418.5215	0.0265
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29	2	28	28	2	27	29	28	/E	75769.1257	0.0026
29	2	28	28	2	27	30	29	/E	75769.1257	-0.0057
29	2	28	28	2	27	28	27	/E	75769.1257	-0.0045
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30	0	30	29	1	29	29	28	/E	76029.3692	0.0577
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30	0	30	29	1	29	30	29	/A	76029.3692	-0.0380
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29	16	13	28	16	12	29	28	/A	77283.0859	0.0688
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32	20	12	31	20	11	31	30	/A	85269.1825	-0.0029
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35	20	16	34	20	15	34	33	/A	93266.5492	-0.0303
35	20	15	34	20	14	36	35	/A	93266.5492	-0.0286
35	20	15	34	20	14	35	34	/E	93266.5492	-0.0302
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35	20	15	34	20	14	36	35	/A	93266.5492	-0.0286
35	20	16	34	20	15	34	33	/E	93267.1305	0.0170
35	20	16	34	20	15	35	34	/E	93267.1305	0.0798
35	20	16	34	20	15	34	33	/E	93267.1305	0.0170
35	18	17	34	18	16	36	35	/E	93274.6140	0.0835
35	18	17	34	18	16	35	34	/E	93274.6140	0.1330
35	18	18	34	18	17	36	35	/A	93274.6140	0.0191
35	18	18	34	18	17	35	34	/A	93274.6140	0.0686
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35	17	19	34	17	18	36	35	/A	93280.1751	0.0284
35	17	18	34	17	17	35	34	/A	93280.1751	0.0725
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35	12	23	34	12	22	34	33	/A	93337.9371	-0.0713
35	12	24	34	12	23	35	34	/A	93337.9371	-0.0494
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35	11	24	34	11	23	36	35	/A	93361.0734	-0.0342
35	11	25	34	11	24	35	34	/A	93361.0734	-0.0159
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35	10	25	34	10	24	34	33	/E	93391.3937	-0.0222

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35	10	26	34	10	25	34	33	/A	93391.9229	-0.0036
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35	9	26	34	9	25	34	33	/A	93434.1836	-0.0092
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35	9	27	34	9	26	36	35	/A	93434.1836	-0.0087
35	8	27	34	8	26	36	35	/A	93494.2684	-0.0339
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35	8	27	34	8	26	35	34	/A	93494.2684	-0.0248
36	1	35	35	1	34	36	35	/E	93571.2944	0.0635
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37	0	37	36	1	36	37	36	/A	93606.6460	-0.0017
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37	1	37	36	1	36	37	36	/A	93625.7633	-0.0292
37	1	37	36	1	36	36	35	/A	93625.7633	-0.0310
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36	20	17	35	20	16	36	35	/A	95932.5454	0.0257
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37	19	19	36	19	18	38	37	/A	98603.0919	0.0517
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39	1	39	38	1	38	39	38	/A	98622.2295	0.0443
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37	10	28	36	10	27	38	37	/E	98748.0906	-0.0693
37	10	27	36	10	26	38	37	/A	98748.0906	0.0523
37	10	28	36	10	27	36	35	/E	98748.0906	-0.0690
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37	9	29	36	9	28	36	35	/E	98798.1475	-0.0950
37	9	29	36	9	28	37	36	/A	98798.1475	0.0016
37	9	28	36	9	27	36	35	/A	98798.1475	-0.0101
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37	8	30	36	8	29	37	36	/A	98869.5137	0.0711
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40	1	40	39	1	39	41	40	/A	101120.1362	0.0096
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38	20	18	37	20	17	38	37	/E	101264.8960	-0.0115
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38	19	20	37	19	19	37	36	/A	101269.7095	0.0214
38	19	19	37	19	18	39	38	/E	101269.7095	0.0242
38	19	19	37	19	18	39	38	/A	101269.7095	0.0223
38	19	19	37	19	18	38	37	/E	101269.7095	0.0673
38	19	20	37	19	19	38	37	/A	101269.7095	0.0654
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38	13	25	37	13	24	39	38	/A	101335.1117	0.0048
38	13	26	37	13	25	39	38	/A	101335.1117	0.0048
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38	11	28	37	11	27	37	36	/A	101387.6229	-0.0329
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38	2	36	37	2	35	39	38	/E	101407.0312	-0.0155
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38	10	29	37	10	28	37	36	/A	101427.3036	-0.0072
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38	10	29	37	10	28	38	37	/A	101427.3036	0.0040
38	10	28	37	10	27	39	38	/A	101427.3036	-0.0075
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38	9	30	37	9	29	37	36	/A	101481.6795	-0.0271
38	9	29	37	9	28	39	38	/A	101481.6795	-0.0310
38	9	30	37	9	29	38	37	/A	101481.6795	-0.0184
38	9	29	37	9	28	37	36	/A	101481.6795	-0.0306
38	9	30	37	9	29	39	38	/A	101481.6795	-0.0275
38	9	29	37	9	28	38	37	/A	101481.6795	-0.0219
38	8	30	37	8	29	38	37	/E	101558.5772	0.0806
38	8	30	37	8	29	37	36	/E	101558.5772	0.0743
38	8	30	37	8	29	39	38	/E	101558.5772	0.0738
38	8	31	37	8	30	39	38	/E	101559.2690	0.0082
38	8	31	37	8	30	37	36	/E	101559.2690	0.0087
38	8	31	37	8	30	38	37	/E	101559.2690	0.0150
38	8	30	37	8	29	38	37	/A	101559.2694	0.0384
38	8	30	37	8	29	39	38	/A	101559.2694	0.0317
38	8	30	37	8	29	37	36	/A	101559.2694	0.0321
38	6	33	37	6	32	37	36	/A	101842.1985	0.0095
38	6	33	37	6	32	39	38	/A	101842.1985	0.0089
38	6	33	37	6	32	38	37	/A	101842.1985	0.0115
38	6	33	37	6	32	39	38	/E	101853.9256	-0.0447
38	6	33	37	6	32	38	37	/E	101853.9256	-0.0421
38	6	33	37	6	32	37	36	/E	101853.9256	-0.0441
38	5	34	37	5	33	38	37	/A	101991.0379	-0.0153
38	5	34	37	5	33	39	38	/A	101991.0379	-0.0172
38	5	34	37	5	33	37	36	/A	101991.0379	-0.0166
38	5	34	37	5	33	37	36	/E	101992.4067	0.0787
38	5	34	37	5	33	38	37	/E	101992.4067	0.0801
38	5	34	37	5	33	39	38	/E	101992.4067	0.0781
38	5	33	37	5	32	38	37	/E	102438.2331	0.0273
38	5	33	37	5	32	37	36	/E	102438.2331	0.0311

38	5	33	37	5	32	39	38	/E	102438.2331	0.0303
38	5	33	37	5	32	37	36	/A	102440.1418	0.0397
38	5	33	37	5	32	38	37	/A	102440.1418	0.0359
38	5	33	37	5	32	39	38	/A	102440.1418	0.0389
40	1	39	39	2	38	41	40	/A	103103.6048	-0.0827
40	1	39	39	2	38	39	38	/A	103103.6048	-0.0819
40	1	39	39	2	38	40	39	/A	103103.6048	-0.0807
40	2	39	39	2	38	39	38	/E	103429.4079	0.0652
40	2	39	39	2	38	41	40	/E	103429.4079	0.0646
40	2	39	39	2	38	40	39	/E	103429.4079	0.0704
40	2	39	39	2	38	41	40	/A	103429.9427	-0.0092
40	2	39	39	2	38	40	39	/A	103429.9427	-0.0033
40	2	39	39	2	38	39	38	/A	103429.9427	-0.0085
41	1	41	40	1	40	41	40	/A	103617.9539	0.0423
41	1	41	40	1	40	42	41	/A	103617.9539	0.0401
41	1	41	40	1	40	40	39	/A	103617.9539	0.0409
39	20	20	38	20	19	40	39	/A	103931.2015	-0.0065
39	20	20	38	20	19	38	37	/A	103931.2015	-0.0075
39	20	20	38	20	19	40	39	/A	103931.2015	-0.0065
39	19	20	38	19	19	38	37	/E	103936.4430	-0.0255
39	19	20	38	19	19	39	38	/A	103936.4430	0.0129
39	19	20	38	19	19	38	37	/A	103936.4430	-0.0278
39	19	20	38	19	19	40	39	/E	103936.4430	-0.0247
39	19	20	38	19	19	39	38	/A	103936.4430	0.0129
39	19	20	38	19	19	40	39	/A	103936.4430	-0.0270
39	19	20	38	19	19	39	38	/E	103936.4430	0.0152
39	19	20	38	19	19	39	38	/E	103936.4430	0.0152
39	19	20	38	19	19	38	37	/A	103936.4430	-0.0278
39	19	20	38	19	19	38	37	/E	103936.4430	-0.0255
39	19	20	38	19	19	40	39	/E	103936.4430	-0.0247
39	19	20	38	19	19	40	39	/A	103936.4430	-0.0270
39	18	21	38	18	20	38	37	/E	103942.8779	-0.0010
39	18	21	38	18	20	39	38	/E	103942.8779	0.0354
39	18	21	38	18	20	39	38	/A	103942.8779	-0.0380
39	18	21	38	18	20	38	37	/A	103942.8779	-0.0745
39	18	21	38	18	20	40	39	/A	103942.8779	-0.0738
39	18	21	38	18	20	40	39	/E	103942.8779	-0.0004
39	16	24	38	16	23	38	37	/A	103960.7729	-0.0084
39	16	24	38	16	23	39	38	/A	103960.7729	0.0202
39	16	23	38	16	22	38	37	/A	103960.7729	-0.0084
39	16	23	38	16	22	40	39	/A	103960.7729	-0.0080
39	16	23	38	16	22	39	38	/A	103960.7729	0.0202
39	16	24	38	16	23	40	39	/A	103960.7729	-0.0080
39	11	29	38	11	28	40	39	/A	104064.4764	-0.0064
39	11	28	38	11	27	39	38	/A	104064.4764	0.0066
39	11	29	38	11	28	39	38	/A	104064.4764	0.0066
39	11	29	38	11	28	38	37	/A	104064.4764	-0.0062
39	11	28	38	11	27	40	39	/A	104064.4764	-0.0064

39	11	28	38	11	27	38	37	/A	104064.4764	-0.0062
39	9	30	38	9	29	39	38	/E	104165.7893	0.0832
39	9	30	38	9	29	40	39	/E	104165.7893	0.0749
39	9	30	38	9	29	38	37	/E	104165.7893	0.0753
39	9	30	38	9	29	38	37	/A	104166.4051	0.0520
39	9	31	38	9	30	40	39	/E	104166.4051	-0.0497
39	9	31	38	9	30	38	37	/E	104166.4051	-0.0493
39	9	30	38	9	29	40	39	/A	104166.4051	0.0516
39	9	31	38	9	30	40	39	/A	104166.4051	0.0571
39	9	31	38	9	30	38	37	/A	104166.4051	0.0575
39	9	31	38	9	30	39	38	/E	104166.4051	-0.0414
39	9	30	38	9	29	39	38	/A	104166.4051	0.0599
39	9	31	38	9	30	39	38	/A	104166.4051	0.0654
39	4	36	38	4	35	39	38	/E	104343.6395	0.0926
39	4	36	38	4	35	40	39	/E	104343.6395	0.0881
39	4	36	38	4	35	38	37	/E	104343.6395	0.0887
39	4	36	38	4	35	39	38	/A	104344.1666	0.0050
39	4	36	38	4	35	40	39	/A	104344.1666	0.0005
39	4	36	38	4	35	38	37	/A	104344.1666	0.0011
39	5	35	38	5	34	39	38	/A	104693.4352	0.0088
39	5	35	38	5	34	38	37	/A	104693.4352	0.0075
39	5	35	38	5	34	40	39	/A	104693.4352	0.0069
39	5	35	38	5	34	40	39	/E	104694.3542	0.0975
39	5	35	38	5	34	39	38	/E	104694.3542	0.0994
39	5	35	38	5	34	38	37	/E	104694.3542	0.0981
41	1	40	40	1	39	42	41	/E	105993.7946	0.0817
41	1	40	40	1	39	41	40	/E	105993.7946	0.0881
41	1	40	40	1	39	40	39	/E	105993.7946	0.0823
41	1	40	40	1	39	40	39	/A	105994.3691	-0.0199
41	1	40	40	1	39	41	40	/A	105994.3691	-0.0142
41	1	40	40	1	39	42	41	/A	105994.3691	-0.0205
42	1	42	41	1	41	43	42	/A	106115.6165	0.0569
42	1	42	41	1	41	42	41	/A	106115.6165	0.0590
42	1	42	41	1	41	41	40	/A	106115.6165	0.0577
40	21	20	39	21	19	39	38	/A	106592.9305	-0.0423
40	21	19	39	21	18	40	39	/A	106592.9305	0.0038
40	21	19	39	21	18	39	38	/A	106592.9305	-0.0423
40	21	20	39	21	19	40	39	/A	106592.9305	0.0038
40	21	19	39	21	18	41	40	/A	106592.9305	-0.0413
40	21	20	39	21	19	41	40	/A	106592.9305	-0.0413
40	20	20	39	20	19	39	38	/A	106597.6206	-0.0213
40	20	20	39	20	19	40	39	/E	106597.6206	-0.0495
40	20	20	39	20	19	40	39	/A	106597.6206	0.0205
40	20	20	39	20	19	39	38	/E	106597.6206	-0.0913
40	20	20	39	20	19	39	38	/E	106597.6206	-0.0913
40	20	20	39	20	19	39	38	/A	106597.6206	-0.0213
40	19	21	39	19	20	39	38	/E	106603.3505	-0.0393
40	19	21	39	19	20	40	39	/A	106603.3505	-0.0044

40	19	21	39	19	20	41	40	/A	106603.3505	-0.0414
40	19	21	39	19	20	39	38	/E	106603.3505	-0.0393
40	19	21	39	19	20	40	39	/E	106603.3505	-0.0017
40	19	21	39	19	20	40	39	/A	106603.3505	-0.0044
40	19	21	39	19	20	41	40	/E	106603.3505	-0.0386
40	19	21	39	19	20	39	38	/A	106603.3505	-0.0421
40	19	21	39	19	20	41	40	/E	106603.3505	-0.0386
40	19	21	39	19	20	40	39	/E	106603.3505	-0.0017
40	19	21	39	19	20	39	38	/A	106603.3505	-0.0421
40	19	21	39	19	20	41	40	/A	106603.3505	-0.0414
40	17	24	39	17	23	40	39	/A	106619.0593	-0.0422
40	17	23	39	17	22	41	40	/A	106619.0593	-0.0718
40	17	24	39	17	23	41	40	/A	106619.0593	-0.0718
40	17	23	39	17	22	39	38	/A	106619.0593	-0.0722
40	17	24	39	17	23	39	38	/A	106619.0593	-0.0722
40	17	23	39	17	22	40	39	/A	106619.0593	-0.0422
40	17	24	39	17	23	39	38	/E	106619.5982	-0.0389
40	17	24	39	17	23	40	39	/E	106619.5982	-0.0090
40	17	24	39	17	23	41	40	/E	106619.5982	-0.0385
40	16	24	39	16	23	40	39	/A	106629.8656	0.0722
40	16	25	39	16	24	39	38	/A	106629.8656	0.0458
40	16	24	39	16	23	41	40	/A	106629.8656	0.0461
40	16	25	39	16	24	41	40	/A	106629.8656	0.0461
40	16	24	39	16	23	39	38	/A	106629.8656	0.0458
40	16	25	39	16	24	40	39	/A	106629.8656	0.0722
40	12	28	39	12	27	40	39	/A	106707.1338	-0.0294
40	12	28	39	12	27	41	40	/A	106707.1338	-0.0438
40	12	29	39	12	28	39	38	/A	106707.1338	-0.0437
40	12	29	39	12	28	41	40	/A	106707.1338	-0.0438
40	12	28	39	12	27	39	38	/A	106707.1338	-0.0437
40	12	29	39	12	28	40	39	/A	106707.1338	-0.0294
40	11	30	39	11	29	40	39	/A	106741.9729	-0.0110
40	11	29	39	11	28	39	38	/A	106741.9729	-0.0228
40	11	29	39	11	28	41	40	/A	106741.9729	-0.0230
40	11	30	39	11	29	41	40	/A	106741.9729	-0.0230
40	11	29	39	11	28	40	39	/A	106741.9729	-0.0110
40	11	30	39	11	29	39	38	/A	106741.9729	-0.0228
40	10	30	39	10	29	41	40	/E	106787.7502	-0.0646
40	10	30	39	10	29	40	39	/E	106787.7502	-0.0548
40	10	30	39	10	29	39	38	/E	106787.7502	-0.0642
40	10	30	39	10	29	41	40	/A	106788.4334	0.0216
40	10	31	39	10	30	41	40	/A	106788.4334	0.0218
40	10	30	39	10	29	39	38	/A	106788.4334	0.0219
40	10	30	39	10	29	40	39	/A	106788.4334	0.0313
40	10	31	39	10	30	39	38	/A	106788.4334	0.0221
40	10	31	39	10	30	40	39	/A	106788.4334	0.0315
40	9	32	39	9	31	40	39	/A	106852.1215	0.0167
40	9	31	39	9	30	40	39	/A	106852.1215	0.0083

40	9	31	39	9	30	39	38	/A	106852.1215	0.0011
40	9	32	39	9	31	41	40	/A	106852.1215	0.0092
40	9	31	39	9	30	41	40	/A	106852.1215	0.0007
40	9	32	39	9	31	39	38	/A	106852.1215	0.0095
40	7	33	39	7	32	39	38	/E	107079.2460	0.0755
40	7	33	39	7	32	41	40	/E	107079.2460	0.0749
40	7	33	39	7	32	40	39	/E	107079.2460	0.0785
40	7	33	39	7	32	40	39	/A	107082.5169	0.0638
40	7	33	39	7	32	39	38	/A	107082.5169	0.0607
40	7	33	39	7	32	41	40	/A	107082.5169	0.0602
43	0	43	42	1	42	43	42	/A	108608.7179	0.0494
43	0	43	42	1	42	44	43	/A	108608.7179	0.0474
43	0	43	42	1	42	42	41	/A	108608.7179	0.0482
43	1	43	42	1	42	44	43	/A	108613.0885	0.0167
43	1	43	42	1	42	43	42	/A	108613.0885	0.0187
43	1	43	42	1	42	42	41	/A	108613.0885	0.0174
43	0	43	42	0	42	43	42	/A	108614.3811	0.0753
43	0	43	42	0	42	42	41	/A	108614.3811	0.0740
43	0	43	42	0	42	44	43	/A	108614.3811	0.0733
41	22	19	40	22	18	42	41	/A	109254.9373	-0.0091
41	22	19	40	22	18	40	39	/A	109254.9373	-0.0101
41	22	19	40	22	18	42	41	/A	109254.9373	-0.0091
41	21	21	40	21	20	42	41	/A	109259.1207	0.0367
41	21	20	40	21	19	41	40	/A	109259.1207	0.0787
41	21	20	40	21	19	40	39	/A	109259.1207	0.0359
41	21	21	40	21	20	41	40	/A	109259.1207	0.0787
41	21	20	40	21	19	40	39	/A	109259.1207	0.0359
41	21	21	40	21	20	42	41	/A	109259.1207	0.0367
41	19	23	40	19	22	42	41	/A	109270.3674	-0.0890
41	19	23	40	19	22	40	39	/A	109270.3674	-0.0896
41	19	23	40	19	22	41	40	/A	109270.3674	-0.0547
41	18	24	40	18	23	40	39	/A	109278.1011	-0.0316
41	18	24	40	18	23	40	39	/A	109278.1011	-0.0316
41	18	24	40	18	23	42	41	/A	109278.1011	-0.0312
41	18	24	40	18	23	42	41	/A	109278.1011	-0.0312
41	18	24	40	18	23	41	40	/A	109278.1011	-0.0004
41	18	24	40	18	23	41	40	/A	109278.1011	-0.0004
41	17	24	40	17	23	41	40	/A	109287.4934	-0.0206
41	17	25	40	17	24	41	40	/A	109287.4934	-0.0206
41	17	25	40	17	24	40	39	/A	109287.4934	-0.0484
41	17	25	40	17	24	42	41	/A	109287.4934	-0.0480
41	17	24	40	17	23	42	41	/A	109287.4934	-0.0480
41	17	24	40	17	23	40	39	/A	109287.4934	-0.0484
41	11	31	40	11	30	40	39	/A	109420.2094	-0.0046
41	11	31	40	11	30	41	40	/A	109420.2094	0.0063
41	11	31	40	11	30	42	41	/A	109420.2094	-0.0048
41	11	30	40	11	29	41	40	/A	109420.2094	0.0063
41	11	30	40	11	29	42	41	/A	109420.2094	-0.0048

41	11	30	40	11	29	40	39	/A	109420.2094	-0.0046

1.2.11 MCA_1 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S11: Measured frequencies and residuals (in MHz) for the rotational transitions of MCA_1 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
6	2	4	5	6	2	5	5	2709.1771	-0.0073
6	2	4	7	6	2	5	7	2709.2514	-0.0095
6	2	4	6	6	2	5	6	2709.7049	-0.0094
3	1	2	2	3	1	3	2	2751.3036	0.0061
3	1	2	3	3	1	3	2	2751.4892	-0.0010
3	1	2	4	3	1	3	4	2751.6292	0.0108
3	1	2	3	3	1	3	4	2751.7715	0.0103
3	1	2	3	3	1	3	3	2752.5439	0.0085
2	0	2	2	1	1	1	1	3181.0051	0.0023
2	0	2	1	1	1	1	0	3181.0999	0.0039
2	0	2	3	1	1	1	2	3181.2064	0.0007
1	0	1	1	0	0	0	1	3226.4704	-0.0193
1	0	1	2	0	0	0	1	3226.8210	-0.0255
1	0	1	0	0	0	0	1	3227.3802	-0.0016
1	1	0	0	1	0	1	1	3685.2581	-0.0004
1	1	0	2	1	0	1	2	3685.7929	0.0029
1	1	0	1	1	0	1	0	3685.8448	-0.0023
1	1	0	2	1	0	1	1	3686.1549	0.0080
1	1	0	1	1	0	1	2	3686.3824	0.0001
1	1	0	1	1	0	1	1	3686.7422	0.0030
2	1	1	1	2	0	2	1	4190.1090	-0.0052
2	1	1	3	2	0	2	3	4190.4995	0.0018
2	1	1	3	2	0	2	2	4190.9378	0.0017
2	1	1	2	2	0	2	2	4191.1892	0.0008
4	1	3	3	4	1	4	3	4570.8029	-0.0002
4	1	3	5	4	1	4	5	4571.0466	0.0046
4	1	3	4	4	1	4	4	4571.9726	0.0014
4	1	3	3	3	2	2	2	4703.1883	-0.0074
4	1	3	5	3	2	2	4	4703.2261	0.0116
4	1	3	4	3	2	2	3	4703.2955	0.0084
3	1	2	2	3	0	3	2	5028.2964	0.0026
3	1	2	4	3	0	3	4	5028.5390	0.0069
3	1	2	3	3	0	3	4	5028.6765	0.0016
3	1	2	3	3	0	3	3	5029.2199	0.0068
2	1	2	2	1	1	1	2	5993.9096	0.0034
2	1	2	2	1	1	1	1	5994.1472	0.0054
2	1	2	1	1	1	1	0	5994.5464	0.0061
2	1	2	3	1	1	1	2	5994.5464	0.0055

2	1	2	1	1	1	1	1	5995.1294	0.0004
4	1	3	3	4	0	4	3	6277.4507	0.0007
4	1	3	5	4	0	4	5	6277.6362	-0.0003
4	1	3	4	4	0	4	4	6278.3652	0.0035
2	0	2	2	1	0	1	2	6407.5732	0.0006
2	0	2	1	1	0	1	0	6407.7175	-0.0017
2	0	2	2	1	0	1	1	6407.9532	0.0237
2	0	2	3	1	0	1	2	6408.0093	-0.0017
2	0	2	1	1	0	1	2	6408.2482	-0.0063
2	0	2	1	1	0	1	1	6408.6128	0.0014
1	1	1	1	0	0	0	1	6453.4194	0.0031
1	1	1	2	0	0	0	1	6453.6570	0.0052
1	1	1	0	0	0	0	1	6454.0121	0.0071
3	0	3	3	2	1	2	3	6687.0288	-0.0069
3	0	3	2	2	1	2	1	6687.4064	-0.0033
3	0	3	4	2	1	2	3	6687.5706	-0.0033
3	0	3	3	2	1	2	2	6687.6658	-0.0045
5	1	4	4	5	1	5	4	6807.7264	-0.0060
5	1	4	6	5	1	5	6	6807.9166	-0.0041
5	1	4	5	5	1	5	5	6808.8415	-0.0039
2	1	1	1	1	1	0	1	6911.9628	-0.0235
2	1	1	2	1	1	0	1	6912.3725	-0.0061
2	1	1	3	1	1	0	2	6912.7160	-0.0027
2	1	1	2	1	1	0	2	6912.9677	-0.0033
2	1	1	1	1	1	0	0	6913.4660	-0.0010
5	2	3	6	5	1	4	6	8606.0438	0.0107
5	2	3	4	5	1	4	4	8606.0438	0.0243
6	2	4	5	6	1	5	5	8723.6491	-0.0042
6	2	4	7	6	1	5	7	8723.6491	-0.0312
6	2	4	6	6	1	5	6	8723.8495	0.0092
4	2	2	3	4	1	3	3	8824.2189	-0.0121
4	2	2	4	4	1	3	4	8824.2189	-0.0099
4	2	2	5	4	1	3	5	8824.2189	-0.0117
5	1	4	6	4	2	3	5	8882.6434	-0.0007
5	1	4	5	4	2	3	4	8882.8139	-0.0125
3	1	3	3	2	1	2	3	8963.6875	-0.0259
3	1	3	3	2	1	2	2	8964.3298	-0.0182
3	1	3	2	2	1	2	1	8964.3974	-0.0085
3	1	3	4	2	1	2	3	8964.4703	-0.0173
3	1	3	2	2	1	2	2	8965.3701	-0.0230
2	1	2	2	1	0	1	2	9220.7126	0.0010
2	1	2	2	1	0	1	1	9221.0777	0.0093
2	1	2	1	1	0	1	0	9221.1816	0.0181
2	1	2	3	1	0	1	2	9221.3499	0.0037
2	1	2	1	1	0	1	1	9222.0613	0.0057
3	2	1	3	3	1	2	3	9246.8041	0.0003
3	2	1	4	3	1	2	4	9246.8041	-0.0009
3	2	1	2	3	1	2	2	9246.8041	-0.0013

6	1	5	5	6	1	6	5	9410.0248	-0.0072
6	1	5	7	6	1	6	7	9410.1916	0.0073
6	1	5	6	6	1	6	6	9411.0823	-0.0040
3	0	3	3	2	0	2	3	9500.3750	0.0041
3	0	3	3	2	0	2	2	9500.8000	-0.0093
3	0	3	2	2	0	2	1	9500.8504	-0.0035
3	0	3	4	2	0	2	3	9500.9250	0.0159
3	0	3	2	2	0	2	2	9501.5490	0.0132
3	2	2	3	2	2	1	2	9679.9863	-0.0046
3	2	2	4	2	2	1	3	9680.3779	0.0047
3	2	2	2	2	2	1	1	9680.5883	0.0027
2	2	0	1	2	1	1	2	9725.4620	-0.0036
2	2	0	3	2	1	1	2	9725.7147	0.0056
2	2	0	1	2	1	1	1	9725.8587	0.0008
2	2	0	3	2	1	1	3	9725.9635	0.0022
2	2	0	2	2	1	1	2	9726.1489	0.0015
2	2	0	2	2	1	1	3	9726.3964	-0.0033
2	2	0	2	2	1	1	1	9726.5397	-0.0001
3	2	1	2	2	2	0	2	9859.2974	-0.0017
3	2	1	3	2	2	0	2	9859.4899	-0.0004
3	2	1	4	2	2	0	3	9859.7907	0.0037
3	2	1	3	2	2	0	3	9859.9825	0.0538
3	2	1	2	2	2	0	1	9859.9825	0.0015
6	1	5	5	6	0	6	5	10186.2730	0.0052
6	1	5	7	6	0	6	7	10186.4118	0.0084
6	1	5	6	6	0	6	6	10187.2137	0.0068
4	0	4	4	3	1	3	4	10198.3622	0.0029
4	0	4	3	3	1	3	2	10198.9099	0.0012
4	0	4	5	3	1	3	4	10199.0113	-0.0006
4	0	4	4	3	1	3	3	10199.1352	0.0017
4	0	4	3	3	1	3	3	10199.9531	-0.0008
3	1	2	2	2	1	1	2	10338.6268	-0.0144
3	1	2	3	2	1	1	2	10338.8272	-0.0068
3	1	2	4	2	1	1	3	10338.9415	-0.0020
2	2	1	1	2	1	2	1	11056.9861	0.0027
2	2	1	3	2	1	2	3	11057.5501	0.0018
2	2	1	2	2	1	2	3	11057.9137	-0.0169
2	2	1	3	2	1	2	2	11058.1915	0.0086
2	2	1	2	2	1	2	2	11058.5742	0.0090
3	2	2	2	3	1	3	2	11773.1638	0.0008
3	2	2	4	3	1	3	4	11773.4343	0.0003
3	2	2	3	3	1	3	3	11774.2065	-0.0017
3	1	3	3	2	0	2	2	11777.5031	0.0162
3	1	3	2	2	0	2	1	11777.8386	-0.0117
3	1	3	4	2	0	2	3	11777.8386	0.0158
3	1	3	2	2	0	2	2	11778.5478	0.0157
4	0	4	4	3	0	3	4	12475.2695	-0.0035
4	0	4	3	3	0	3	2	12475.9140	0.0089

4	0	4	5	3	0	3	4	12475.9140	-0.0116
4	0	4	3	3	0	3	3	12476.6348	0.0033
4	2	3	3	4	1	4	3	12739.1628	0.0062
4	2	3	5	4	1	4	5	12739.3368	0.0054
4	2	3	4	4	1	4	4	12740.0134	0.0014
4	2	3	4	3	2	2	3	12871.3452	0.0175
4	2	3	5	3	2	2	4	12871.4986	-0.0053
4	3	2	4	3	3	1	3	12989.9430	0.0000
4	3	2	5	3	3	1	4	12990.2761	0.0039
4	3	2	3	3	3	1	2	12990.4001	-0.0043
4	3	1	4	3	3	0	3	13006.9194	0.0084
4	3	1	5	3	3	0	4	13007.2307	-0.0006
4	3	1	3	3	3	0	2	13007.3742	0.0126
4	2	2	4	3	2	1	3	13302.4188	0.0341
4	2	2	5	3	2	1	4	13302.4188	-0.0368
4	2	2	3	3	2	1	2	13302.4188	-0.0681
5	0	5	6	4	1	4	5	13625.6828	0.0278
5	0	5	5	4	1	4	4	13625.6828	-0.0604
5	0	5	4	4	1	4	3	13625.6828	0.0914
4	1	3	3	3	1	2	4	13725.0325	0.0212
4	1	3	5	3	1	2	4	13725.0325	0.0025
2	2	1	1	2	0	2	1	13870.4187	-0.0089
2	2	1	3	2	0	2	3	13870.8819	-0.0016
2	2	1	2	2	0	2	2	13871.7064	0.0022
3	2	2	2	3	0	3	2	14050.1782	0.0189
3	2	2	4	3	0	3	4	14050.3632	0.0156
3	2	2	3	3	0	3	3	14050.8970	0.0112
4	1	4	4	3	0	3	3	14182.1854	-0.0162
4	1	4	5	3	0	3	4	14182.4936	-0.0265
4	2	3	3	4	0	4	3	14445.7880	-0.0156
4	2	3	5	4	0	4	5	14445.9173	-0.0087
4	2	3	4	4	0	4	4	14446.3874	-0.0151
5	1	5	5	4	1	4	5	14813.1581	0.0218
5	1	5	4	4	1	4	3	14814.0003	-0.0215
5	1	5	5	4	1	4	4	14814.0003	0.0074
5	1	5	6	4	1	4	5	14814.0003	-0.0546
5	1	5	4	4	1	4	4	14815.0797	-0.0190
5	2	4	4	5	0	5	4	15146.0547	-0.0098
5	2	4	6	5	0	5	6	15146.1437	-0.0196
5	2	4	5	5	0	5	5	15146.6293	-0.0193
5	0	5	4	4	0	4	3	15332.2546	0.0162
5	0	5	6	4	0	4	5	15332.2546	0.0051
6	3	3	6	6	2	4	6	15561.1654	-0.0182
6	3	3	5	6	2	4	5	15561.2826	-0.0239
6	3	3	7	6	2	4	7	15561.2826	-0.0061
5	2	4	4	4	2	3	3	16032.5183	0.0190
5	2	4	6	4	2	3	5	16032.5183	0.0314
5	3	3	4	4	3	2	3	16262.6851	-0.0135

5	3	3	6	4	3	2	5	16262.6851	0.0300
5	1	5	5	4	0	4	4	16520.4036	0.0202
2	2	1	1	1	1	0	1	16592.2943	-0.0054
2	2	1	1	1	1	0	2	16592.8852	-0.0068
2	2	1	2	1	1	0	1	16592.8852	-0.0093
2	2	1	3	1	1	0	2	16593.0912	-0.0132
2	2	1	2	1	1	0	2	16593.4723	-0.0144
2	2	1	1	1	1	0	0	16593.7669	-0.0136
4	3	1	3	4	2	2	3	16791.2920	0.0066
4	3	1	5	4	2	2	5	16791.2920	-0.0253
5	2	3	5	4	2	2	4	16832.7110	-0.0272
5	2	3	6	4	2	2	5	16832.7110	-0.0253
5	2	3	4	4	2	2	5	16832.7110	-0.0104
6	0	6	7	5	1	5	6	16913.4997	-0.0389
6	0	6	5	5	1	5	4	16913.4997	0.0009
6	0	6	6	5	1	5	5	16913.5607	-0.0244
5	1	4	5	4	1	3	4	17050.9037	0.0365
5	1	4	6	4	1	3	5	17050.9037	-0.0300
5	1	4	4	4	1	3	3	17050.9037	-0.0474
3	3	0	2	3	2	1	2	17086.3867	-0.0240
3	3	0	4	3	2	1	4	17086.5190	-0.0225
3	3	0	3	3	2	1	3	17086.8907	-0.0244
2	2	0	1	1	1	1	0	17097.0665	-0.0016
2	2	0	1	1	1	1	1	17097.6678	0.0111
2	2	0	2	1	1	1	2	17098.1043	0.0012
2	2	0	2	1	1	1	1	17098.3393	0.0007
3	3	1	4	3	2	2	3	17308.6932	0.0072
3	3	1	3	3	2	2	4	17309.2152	0.0166
6	1	6	6	5	1	5	5	17689.7330	0.0274
6	1	6	5	5	1	5	4	17689.7330	-0.0015
6	1	6	7	5	1	5	6	17689.7330	-0.0247
7	3	5	8	7	2	6	8	18612.6619	-0.0129
7	3	5	6	7	2	6	6	18612.6619	0.0287
7	3	5	7	7	2	6	7	18612.9753	0.0121
6	1	6	6	5	0	5	5	18877.9713	0.0159
6	1	6	5	5	0	5	4	18878.1710	0.0061
6	1	6	7	5	0	5	6	18878.1710	0.0134
8	2	7	9	8	1	8	9	19043.3214	0.0270
8	2	7	8	8	1	8	8	19043.8382	-0.0242
6	2	5	7	5	2	4	6	19156.5820	-0.0160
6	2	5	6	5	2	4	5	19156.5820	0.0630
6	2	5	5	5	2	4	4	19156.5820	-0.0195
3	2	2	3	2	1	1	2	19360.5215	0.0148
3	2	2	4	2	1	1	3	19360.7962	0.0372
3	2	2	2	2	1	1	1	19360.7962	-0.1029
8	3	6	9	8	2	7	9	19406.0230	-0.0278
8	3	6	7	8	2	7	7	19406.0230	0.0102
8	3	6	8	8	2	7	8	19406.3531	0.0006

6	4	3	7	5	4	2	6	19513.4821	0.0004
6	4	3	5	5	4	2	4	19513.4821	-0.0380
6	4	2	5	5	4	1	4	19518.7186	-0.0340
6	4	2	7	5	4	1	6	19518.7186	0.0041
7	0	7	8	6	1	6	7	20054.1862	0.0581
7	0	7	7	6	1	6	6	20054.1862	0.0442
6	1	5	7	5	1	4	6	20292.0597	0.0383
6	1	5	5	5	1	4	4	20292.0597	0.0255
2	2	0	1	1	0	1	0	20323.7108	0.0196
2	2	0	3	1	0	1	2	20324.4797	0.0097
2	2	0	2	1	0	1	1	20325.2663	0.0010
6	2	4	6	5	2	3	5	20409.6763	-0.0106
6	2	4	7	5	2	3	6	20409.6763	0.0077
7	0	7	8	6	0	6	7	20830.3574	0.0102
7	0	7	6	6	0	6	5	20830.3574	0.0195
3	2	1	2	2	1	2	1	20962.5282	0.0194
3	2	1	4	2	1	2	3	20962.9341	0.0232
3	2	1	3	2	1	2	2	20963.7058	0.0186
7	1	7	6	6	0	6	5	21312.0149	-0.0256
7	1	7	8	6	0	6	7	21312.0149	-0.0263
8	1	7	9	7	2	6	8	21587.8900	-0.0036
8	1	7	7	7	2	6	6	21587.8900	0.0258
4	2	3	4	3	1	2	3	21893.0330	0.0325
4	2	3	5	3	1	2	4	21893.3189	-0.0006
7	6	1	7	6	6	0	6	22714.3228	0.0382
7	6	2	8	6	6	1	7	22714.5329	0.0039
7	6	2	6	6	6	1	5	22714.5329	-0.0483
7	4	4	6	6	4	3	5	22806.9929	-0.0568
7	4	4	8	6	4	3	7	22806.9929	-0.0393
7	4	4	7	6	4	3	6	22806.9929	0.0626
7	3	5	8	6	3	4	7	22810.7763	-0.0199
7	3	5	7	6	3	4	6	22810.7763	0.0427
7	3	5	6	6	3	4	5	22810.7763	-0.0270
7	4	3	7	6	4	2	6	22824.2276	0.0714
7	4	3	6	6	4	2	5	22824.2276	-0.0433
7	4	3	8	6	4	2	7	22824.2276	-0.0263
8	4	4	7	8	3	5	7	23012.6620	-0.0394
8	4	4	9	8	3	5	9	23012.6620	-0.0357
8	4	4	8	8	3	5	8	23012.6620	-0.0063
8	0	8	7	7	1	7	6	23069.8729	0.0185
8	0	8	8	7	1	7	7	23069.8729	0.0069
8	0	8	9	7	1	7	8	23069.8729	0.0007
7	3	4	7	6	3	3	6	23137.9818	0.0154
7	3	4	6	6	3	3	5	23137.9818	0.0017
7	3	4	8	6	3	3	7	23137.9818	0.0032
7	1	6	6	6	1	5	5	23421.6361	0.0216
7	1	6	8	6	1	5	7	23421.6361	0.0325
7	3	5	6	7	1	6	6	23443.7714	0.0324

7	3	5	8	7	1	6	8	23443.7714	0.0300
7	3	5	7	7	1	6	7	23443.7714	0.0135
7	4	3	7	7	3	4	7	23527.7517	-0.0315
7	4	3	8	7	3	4	8	23527.7517	0.0141
7	4	3	6	7	3	4	6	23527.7517	0.0207
3	2	1	2	2	0	2	1	23775.9728	0.0198
3	2	1	4	2	0	2	3	23776.2746	0.0285
3	2	1	3	2	0	2	2	23776.8392	0.0131
8	1	8	7	7	0	7	6	23839.0906	0.0370
8	1	8	9	7	0	7	8	23839.0906	0.0320
6	4	2	6	6	3	3	6	23841.4698	-0.1236
6	4	2	7	6	3	3	7	23841.4698	0.0074
6	4	2	5	6	3	3	5	23841.4698	0.0296
7	2	5	8	6	2	4	7	23977.3949	0.0000
7	2	5	6	6	2	4	5	23977.3949	-0.0008
7	2	5	7	6	2	4	6	23977.3949	-0.0106
5	4	1	6	5	3	2	6	24013.9340	0.0019
5	4	1	4	5	3	2	4	24013.9340	0.0499
5	4	1	5	5	3	2	5	24014.1749	0.0071
7	4	4	7	7	3	5	7	24061.6252	-0.0948
7	4	4	8	7	3	5	8	24061.6252	0.0581
7	4	4	6	7	3	5	6	24061.6252	0.0801
6	4	3	5	6	3	4	5	24065.3928	0.0942
6	4	3	7	6	3	4	7	24065.3928	0.0618
6	4	3	6	6	3	4	6	24065.3928	-0.1304
5	4	2	4	5	3	3	4	24090.9640	0.0638
5	4	2	6	5	3	3	6	24090.9640	0.0098
5	4	2	5	5	3	3	5	24091.2582	0.0387
5	2	4	5	4	1	3	4	24200.4532	0.0326
5	2	4	4	4	1	3	3	24200.7989	-0.0539
5	2	4	6	4	1	3	5	24200.7989	0.0225
5	3	3	5	5	1	4	5	24807.5000	0.0230
5	3	3	6	5	1	4	6	24807.5000	0.0348
5	3	3	4	5	1	4	4	24807.5000	0.0372
8	2	7	8	7	2	6	7	25273.5268	-0.0395
4	2	2	5	3	1	3	4	25300.8481	-0.0308
4	2	2	4	3	1	3	3	25301.7467	0.0227
9	0	9	10	8	1	8	9	25993.5144	-0.0438
9	0	9	8	8	1	8	7	25993.5144	-0.0307
9	0	9	9	8	1	8	8	25993.5144	-0.0270
6	0	6	5	5	0	5	4	18101.9686	0.0394
6	0	6	7	5	0	5	6	18101.9686	0.0301

1.2.12 MCA_1 A state line list in the frequency range of 75-110 GHz using SPFIT/SPCAT.

Table S12: Measured frequencies and residuals (in MHz) for the rotational transitions of MCA_1 A state in the high frequency region (75-110 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	Observed Freq. (MHz)	Residuals (MHz)
27	0	27	26	0	26	76009.1752	0.0795
27	1	27	26	1	26	76009.1752	0.0810
29	0	29	28	0	28	81539.6568	-0.0532
29	1	29	28	1	28	81539.6568	-0.0528
30	0	30	29	0	29	84304.8716	0.0925
30	1	30	29	1	29	84304.8716	0.0927
33	0	33	32	0	32	92599.0355	0.0807
33	1	33	32	1	32	92599.0355	0.0807
37	0	37	36	0	36	103655.1412	-0.0741
37	1	37	36	1	36	103655.1412	-0.0741
38	0	38	37	0	37	106418.8190	0.0506
38	1	38	37	1	37	106418.8190	0.0506
39	0	39	38	0	38	109182.0446	-0.0600
39	1	39	38	1	38	109182.0446	-0.0600
29	1	28	28	1	27	84145.7411	-0.1171
29	2	28	28	2	27	84145.7411	-0.0870
31	1	30	30	1	29	89674.4755	-0.1020
31	2	30	30	2	29	89674.4755	-0.0937
32	1	31	31	1	30	92438.6982	-0.0584
32	2	31	31	2	30	92438.6982	-0.0540
33	1	32	32	1	31	95202.7871	-0.0085
33	2	32	32	2	31	95202.7871	-0.0062
34	1	33	33	1	32	97966.6952	0.0131
34	2	33	33	2	32	97966.6952	0.0143
35	1	34	34	1	33	100730.3487	-0.0562
35	2	34	34	2	33	100730.3487	-0.0555
37	1	36	36	1	35	106257.4228	0.1040
37	2	36	36	2	35	106257.4228	0.1041
38	1	37	37	1	36	109020.5240	0.0324
38	2	37	37	2	36	109020.5240	0.0325
25	3	23	24	3	22	75721.6223	-0.0413
26	2	24	25	2	23	78489.7064	-0.0010
26	3	24	25	3	23	78484.0110	-0.0193
27	2	25	26	2	24	81249.4223	0.0675
27	3	25	26	3	24	81246.2141	0.0728
28	2	26	27	2	25	84009.9961	-0.0120
28	3	26	27	3	25	84008.1575	-0.0461
29	2	27	28	2	26	86771.3352	0.0167
29	3	27	28	3	26	86770.2997	-0.0129
30	2	28	29	2	27	89533.0383	-0.0188
33	2	31	32	2	30	97819.4396	-0.0824
33	3	31	32	3	30	97819.4396	0.0091

34	2	32	33	2	31	100581.7873	-0.0406
34	3	32	33	3	31	100581.7873	0.0090
35	2	33	34	2	32	103344.1086	-0.0159
35	3	33	34	3	32	103344.1086	0.0109
36	2	34	35	2	33	106106.3447	-0.0313
36	3	34	35	3	33	106106.3447	-0.0169
37	2	35	36	2	34	108868.5521	-0.0018
37	3	35	36	3	34	108868.5521	0.0060
24	3	21	23	3	20	75825.7663	-0.0296
25	3	22	24	3	21	78522.2573	0.0401
26	3	23	25	3	22	81238.1765	-0.0309
29	3	26	28	3	25	89453.0920	-0.0636
30	3	27	29	3	26	92203.2747	-0.0114
31	3	28	30	3	27	94956.3969	0.0360
32	3	29	31	3	28	97711.4391	-0.0078
34	3	31	33	3	30	103225.3544	-0.0225
35	3	32	34	3	31	105983.4951	-0.0258
36	3	33	35	3	32	108742.2542	0.0960
25	4	22	24	4	21	78379.0206	0.0563
24	4	20	23	4	19	79393.7592	0.0304
25	4	21	24	4	20	81923.4866	0.0423
27	4	24	26	4	23	83914.0601	-0.0099
28	4	25	27	4	24	86675.0143	0.0461
27	4	23	26	4	22	87058.0774	0.0233
29	4	26	28	4	25	89433.9358	0.0054
29	4	26	28	4	25	89433.9369	0.0065
28	4	24	27	4	23	89684.0992	-0.0246
29	4	25	28	4	24	92345.0726	-0.0325
30	4	26	29	4	25	95033.4382	0.0626
32	4	29	31	4	28	97707.7053	0.0403
32	4	29	31	4	28	97707.7053	0.0403
31	4	27	30	4	26	97741.7290	0.0107
33	4	30	32	4	29	100465.8633	0.1023
34	4	31	33	4	30	103224.1276	-0.0207
34	4	30	33	4	29	105936.3470	0.0125
24	5	20	23	5	19	77951.4222	-0.0151
25	5	21	24	5	20	80853.0211	0.0381
27	5	23	26	5	22	86539.0936	0.0194
28	5	24	27	5	23	89339.7940	-0.0916
27	5	22	26	5	21	90981.8785	0.0511
28	5	23	27	5	22	93505.7912	-0.1071
30	5	26	29	5	25	94891.9338	-0.0217
31	5	27	30	5	26	97653.4288	-0.0429
33	5	29	32	5	28	103163.9439	0.0328
34	5	30	33	5	29	105916.4712	-0.0611
35	5	31	34	5	30	108668.7706	-0.0372
34	5	29	33	5	28	108862.8304	0.0365

1.2.13 MCA_2 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S13. Measured frequencies and residuals (in MHz) for the rotational transitions of MCA_2 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
1	0	1	1	0	0	0	1	2662.6421	-0.0104
1	0	1	2	0	0	0	1	2663.5162	-0.0238
1	0	1	0	0	0	0	1	2664.8520	-0.0196
1	1	1	0	2	0	2	1	2691.6026	-0.0005
1	1	1	1	2	0	2	1	2692.2974	0.0033
1	1	1	2	2	0	2	3	2692.5540	0.0058
1	1	1	2	2	0	2	2	2693.5099	0.0072
1	1	1	1	2	0	2	2	2693.7832	0.0042
4	0	4	4	3	1	3	3	3009.9768	-0.0016
4	0	4	3	3	1	3	2	3009.9768	-0.0394
4	0	4	5	3	1	3	4	3010.0713	-0.0056
4	0	4	4	3	1	3	4	3009.0421	-0.0096
4	0	4	3	3	1	3	3	3011.2644	-0.0028
6	2	5	7	7	1	6	8	3415.0865	0.0041
6	2	5	5	7	1	6	6	3415.0865	-0.0055
6	2	5	6	7	1	6	7	3415.1325	-0.0097
2	1	2	2	1	1	1	1	5162.3327	-0.0071
2	1	2	2	1	1	1	2	5162.6094	-0.0067
2	1	2	3	1	1	1	2	5163.2698	-0.0010
2	1	2	1	1	1	1	1	5163.3503	-0.0082
2	1	2	1	1	1	1	2	5163.6316	-0.0032
2	1	2	1	1	1	1	0	5164.0489	-0.0006
2	0	2	2	1	0	1	2	5323.4075	-0.0013
2	0	2	1	1	0	1	0	5323.5212	-0.0410
2	0	2	2	1	0	1	1	5324.2600	-0.0364
2	0	2	3	1	0	1	2	5324.3658	0.0025
2	0	2	1	1	0	1	2	5324.8577	-0.0360
2	0	2	1	1	0	1	1	5325.7509	-0.0303
2	1	1	2	1	1	0	1	5489.7404	-0.0055
2	1	1	1	1	1	0	1	5490.2009	-0.0062
2	1	1	2	1	1	0	2	5490.3543	-0.0026
2	1	1	3	1	1	0	2	5490.6549	0.0018
2	1	1	1	1	1	0	0	5491.7356	0.0010
5	0	5	5	4	1	4	5	5955.1798	-0.0094
5	0	5	4	4	1	4	3	5956.2301	0.0468
5	0	5	6	4	1	4	5	5956.2301	-0.0094
5	0	5	5	4	1	4	4	5956.2301	-0.0094
5	0	5	4	4	1	4	4	5957.5012	-0.0025
5	2	4	4	6	1	5	5	6628.3840	-0.0024
5	2	4	6	6	1	5	7	6628.3840	-0.0076
5	2	4	5	6	1	5	6	6628.5450	-0.0047

3	1	3	3	2	1	2	3	7742.2271	-0.0044
3	1	3	3	2	1	2	2	7742.8857	-0.0004
3	1	3	2	2	1	2	1	7743.0994	-0.0191
3	1	3	4	2	1	2	3	7743.1592	0.0012
3	1	3	2	2	1	2	2	7744.1364	-0.0007
3	0	3	3	2	0	2	3	7979.2646	-0.0168
3	0	3	2	2	0	2	1	7980.0870	-0.0076
3	0	3	3	2	0	2	2	7980.2267	-0.0091
3	0	3	4	2	0	2	3	7980.2267	-0.0499
3	0	3	2	2	0	2	2	7981.5701	-0.0094
3	2	2	3	2	2	1	2	7989.4355	0.0023
3	2	2	3	2	2	1	3	7990.3871	0.0029
3	2	2	2	2	2	1	1	7990.9192	0.0066
3	2	1	3	2	2	0	2	7999.3461	-0.0131
3	2	1	2	2	2	0	3	8000.2978	-0.0039
1	1	0	1	1	0	1	0	8179.8356	-0.0032
1	1	0	0	1	0	1	1	8180.5634	0.0331
1	1	0	2	1	0	1	2	8180.5634	0.0041
1	1	0	1	1	0	1	2	8181.1555	-0.0147
1	1	0	2	1	0	1	1	8181.4368	-0.0099
1	1	0	1	1	0	1	1	8182.0513	-0.0065
3	1	2	3	2	1	1	3	8233.6828	0.0095
3	1	2	3	2	1	1	2	8233.9618	-0.0078
3	1	2	4	2	1	1	3	8234.2068	-0.0215
3	1	2	2	2	1	1	1	8234.2068	-0.0509
3	1	2	2	2	1	1	2	8234.7173	-0.0017
2	1	1	2	2	0	2	1	8346.0241	0.0017
2	1	1	3	2	0	2	3	8346.8519	0.0028
2	1	1	2	2	0	2	2	8347.5114	0.0041
2	1	1	3	2	0	2	2	8347.8108	0.0072
2	1	1	1	2	0	2	2	8347.9757	0.0072
2	1	1	1	2	0	2	1	8346.4909	0.0073
2	1	1	2	2	0	2	3	8346.4909	-0.0620
3	1	2	3	3	0	3	2	8599.9026	0.0052
3	1	2	3	3	0	3	4	8600.2498	0.0039
3	1	2	2	3	0	3	2	8600.6515	0.0048
3	1	2	4	3	0	3	4	8600.8006	-0.0002
3	1	2	3	3	0	3	3	8601.2404	-0.0007
3	1	2	4	3	0	3	3	8601.8016	0.0056
3	1	2	2	3	0	3	3	8601.9949	0.0045
4	1	3	4	4	0	4	3	8947.0365	0.0021
4	1	3	4	4	0	4	5	8947.2926	-0.0056
4	1	3	3	4	0	4	3	8947.8776	0.0005
4	1	3	5	4	0	4	5	8947.9716	0.0032
4	1	3	4	4	0	4	4	8948.3227	-0.0007
4	1	3	5	4	0	4	4	8948.9903	-0.0033
4	1	3	3	4	0	4	4	8949.1697	0.0037
6	0	6	5	5	1	5	4	8953.1788	0.0296

6	0	6	7	5	1	5	6	8953.1788	-0.0174
6	0	6	6	5	1	5	5	8953.1788	-0.0642
5	1	4	5	5	0	5	4	9394.6324	-0.0001
5	1	4	5	5	0	5	6	9394.8370	-0.0095
5	1	4	4	5	0	5	4	9395.5648	0.0486
5	1	4	6	5	0	5	6	9395.5648	-0.0158
5	1	4	5	5	0	5	5	9395.8957	-0.0010
5	1	4	6	5	0	5	5	9396.6248	-0.0060
5	1	4	4	5	0	5	5	9396.7774	-0.0030
6	1	5	5	6	0	6	5	9952.3115	-0.0293
6	1	5	7	6	0	6	7	9952.4217	0.0306
6	1	5	6	6	0	6	6	9952.6892	0.0000
5	2	3	4	6	1	6	5	10150.6174	0.0453
5	2	3	6	6	1	6	7	10150.6174	-0.0309
5	2	3	5	6	1	6	6	10151.2243	0.0021
4	1	4	4	3	1	3	4	10320.2453	0.0063
4	1	4	4	3	1	3	3	10321.1706	0.0049
4	1	4	3	3	1	3	2	10321.2931	0.0581
4	1	4	5	3	1	3	4	10321.2931	0.0038
4	1	4	3	3	1	3	3	10322.5104	0.0243
4	0	4	4	3	0	3	4	10627.7212	-0.0311
4	0	4	3	3	0	3	2	10628.6722	-0.0204
4	0	4	4	3	0	3	3	10628.6722	-0.0752
4	0	4	5	3	0	3	4	10628.7816	0.0042
4	0	4	3	3	0	3	3	10630.0091	-0.0273
4	2	3	4	3	2	2	3	10651.3068	-0.0141
4	2	3	5	3	2	2	4	10651.7140	-0.0112
4	2	3	3	3	2	2	2	10651.8106	-0.0185
4	2	2	4	3	2	1	3	10676.1146	0.0088
4	2	2	5	3	2	1	4	10676.4953	-0.0073
4	2	2	3	3	2	1	2	10676.5996	-0.0058
1	1	1	0	0	0	0	1	10680.0241	-0.0127
1	1	1	2	0	0	0	1	10680.4542	0.0028
1	1	1	1	0	0	0	1	10680.7261	-0.0017
4	1	3	4	3	1	2	3	10975.7998	-0.0299
4	1	3	3	3	1	2	2	10975.9065	-0.0166
4	1	3	5	3	1	2	4	10975.9065	-0.0386
7	0	7	6	6	1	6	5	11989.5992	-0.0397
7	0	7	8	6	1	6	7	11989.7102	0.0327
7	0	7	7	6	1	6	6	11989.7102	-0.0369
4	2	2	3	5	1	5	4	12259.5699	-0.0016
4	2	2	5	5	1	5	6	12259.6884	-0.0114
4	2	2	4	5	1	5	5	12260.4230	-0.0090
9	1	8	8	9	0	9	8	12381.1461	0.0100
9	1	8	10	9	0	9	10	12381.1795	0.0105
9	1	8	9	9	0	9	9	12381.4642	0.0009
8	1	7	7	8	0	8	7	11434.3505	0.0496
8	1	7	9	8	0	8	9	11434.3505	0.0130

8	1	7	8	8	0	8	8	11434.6109	-0.0175
3	2	2	2	4	1	3	3	12830.9282	-0.0033
3	2	2	4	4	1	3	5	12831.0934	-0.0104
3	2	2	3	4	1	3	4	12831.7728	-0.0012
5	1	5	5	4	1	4	5	12895.9582	0.0144
5	1	5	5	4	1	4	4	12897.0106	0.0165
5	1	5	4	4	1	4	3	12897.0106	-0.0111
5	1	5	6	4	1	4	5	12897.0106	-0.0531
5	1	5	4	4	1	4	4	12898.3293	-0.0127
2	1	2	1	1	0	1	0	13179.1963	-0.0185
2	1	2	2	1	0	1	2	13179.5091	-0.0185
2	1	2	3	1	0	1	2	13180.1673	-0.0150
2	1	2	2	1	0	1	1	13180.4005	-0.0147
2	1	2	1	1	0	1	1	13181.4219	-0.0120
5	0	5	5	4	0	4	5	13266.3612	-0.0404
5	0	5	4	4	0	4	3	13267.4412	0.0391
5	0	5	5	4	0	4	4	13267.4412	0.0144
5	0	5	6	4	0	4	5	13267.4412	-0.0106
5	0	5	4	4	0	4	4	13268.6490	-0.0420
5	2	4	5	4	2	3	4	13311.2586	0.0135
5	2	4	6	4	2	3	5	13311.4566	-0.0010
5	2	4	4	4	2	3	3	13311.4566	-0.0226
5	2	3	5	4	2	2	4	13360.7355	0.0295
5	2	3	6	4	2	2	5	13360.9491	0.0403
5	2	3	4	4	2	2	3	13360.9491	0.0197
10	1	9	9	10	0	10	9	13479.1517	0.0091
10	1	9	11	10	0	10	11	13479.1517	-0.0211
10	1	9	10	10	0	10	10	13479.4303	-0.0425
5	1	4	4	4	1	3	3	13715.0920	0.0508
5	1	4	6	4	1	3	5	13715.0920	0.0280
3	2	1	2	4	1	4	3	14479.9690	-0.0188
3	2	1	4	4	1	4	5	14480.2414	-0.0195
3	2	1	3	4	1	4	4	14481.3145	-0.0057
8	0	8	7	7	1	7	6	15053.1953	0.0177
8	0	8	9	7	1	7	8	15053.1953	-0.0142
8	0	8	8	7	1	7	7	15053.3208	0.0319
6	1	6	6	5	1	5	5	15469.9167	0.0009
6	1	6	5	5	1	5	4	15469.9167	-0.0123
6	1	6	7	5	1	5	6	15469.9862	0.0258
3	1	3	3	2	0	2	3	15598.0216	-0.0289
3	1	3	2	2	0	2	1	15598.7435	-0.0276
3	1	3	4	2	0	2	3	15598.9674	-0.0097
3	1	3	3	2	0	2	2	15598.9674	-0.0375
3	1	3	2	2	0	2	2	15600.2298	-0.0262
2	2	1	1	3	1	2	2	15815.9296	-0.0123
2	2	1	3	3	1	2	4	15816.6701	0.0055
2	2	1	2	3	1	2	3	15818.1742	0.0037
6	2	5	5	5	2	4	4	15969.1539	0.0258

6	2	5	7	5	2	4	6	15969.1539	0.0257
6	2	4	6	5	2	3	5	16055.2831	0.0582
6	2	4	5	5	2	3	4	16055.3701	0.0307
6	2	4	7	5	2	3	6	16055.3701	0.0296
6	1	5	6	5	1	4	5	16450.8053	0.0151
6	1	5	5	5	1	4	4	16450.8053	-0.0069
6	1	5	7	5	1	4	6	16450.8053	-0.0256
2	2	0	1	3	1	3	2	16800.3898	-0.0012
2	2	0	3	3	1	3	4	16801.2461	0.0005
2	2	0	2	3	1	3	3	16803.1315	0.0049
4	1	4	3	3	0	3	2	17939.9146	0.0031
4	1	4	4	3	0	3	3	17939.9146	-0.0202
4	1	4	5	3	0	3	4	17940.0109	0.0211
7	1	7	7	6	1	6	6	18039.5182	0.0271
7	1	7	6	6	1	6	5	18039.5182	0.0198
7	1	7	8	6	1	6	7	18039.5182	-0.0043
7	0	7	6	6	0	6	5	18506.4784	0.0599
7	0	7	7	6	0	6	6	18506.4784	0.0585
7	0	7	8	6	0	6	7	18506.4784	0.0366
8	0	8	8	7	0	7	7	21103.0827	0.0498
8	0	8	7	7	0	7	6	21103.0827	0.0455
8	0	8	9	7	0	7	8	21103.0827	0.0282
7	1	6	8	6	1	5	7	19182.4253	-0.0122
7	1	6	6	6	1	5	5	19182.4253	0.0027
7	1	6	7	6	1	5	6	19182.4253	0.0166
8	1	8	8	7	1	7	7	20605.3376	0.0023
8	1	8	7	7	1	7	6	20605.3376	-0.0026
8	1	8	9	7	1	7	8	20605.3376	-0.0215
7	2	6	7	6	2	5	6	18624.3391	0.1112
7	2	6	6	6	2	5	5	18624.3391	0.0345
7	2	6	8	6	2	5	7	18624.3391	0.0282
7	2	5	7	6	2	4	6	18761.4015	0.0701
7	2	5	6	6	2	4	5	18761.4015	0.0076
7	2	5	8	6	2	4	7	18761.4015	0.0003
8	2	7	8	7	2	6	7	21276.5758	0.0445
8	2	7	7	7	2	6	6	21276.5758	-0.0057
8	2	7	9	7	2	6	8	21276.5758	-0.0135
8	2	6	8	7	2	5	7	21480.2989	0.0233
8	2	6	7	7	2	5	6	21480.2989	-0.0112
8	2	6	9	7	2	5	8	21480.2989	-0.0200
9	2	8	9	8	2	7	8	23925.5227	0.0113
9	2	8	8	8	2	7	7	23925.5227	-0.0238
9	2	8	10	8	2	7	9	23925.5227	-0.0315
9	2	7	9	8	2	6	8	24212.7467	-0.0025
9	2	7	8	8	2	6	7	24212.7467	-0.0206
9	2	7	10	8	2	6	9	24212.7467	-0.0292
7	3	5	7	6	3	4	6	18662.8029	0.1492
7	3	5	8	6	3	4	7	18662.8029	-0.0201

7	3	5	6	6	3	4	5	18662.8029	-0.0356
7	3	4	7	6	3	3	6	18665.7588	0.1483
7	3	4	6	6	3	3	5	18665.7588	-0.0359
7	3	4	8	6	3	3	7	18665.7588	-0.0205
8	3	6	8	7	3	5	7	21333.7700	0.0694
8	3	6	9	7	3	5	8	21333.7700	-0.0451
8	3	6	7	7	3	5	6	21333.7700	-0.0498
8	3	5	8	7	3	4	7	21339.6688	0.0633
8	3	5	9	7	3	4	8	21339.6688	-0.0504
8	3	5	7	7	3	4	6	21339.6688	-0.0549
9	3	7	9	8	3	6	8	24006.3062	0.0632
9	3	7	8	8	3	6	7	24006.3062	-0.0177
9	3	7	10	8	3	6	9	24006.3062	-0.0178
9	3	6	9	8	3	5	8	24017.1062	0.0607
9	3	6	8	8	3	5	7	24017.1062	-0.0189
9	3	6	10	8	3	5	9	24017.1062	-0.0191
7	4	4	7	6	4	3	6	18655.8407	0.0604
7	4	3	7	6	4	2	6	18655.8407	0.0383
7	4	4	8	6	4	3	7	18656.1231	0.0470
7	4	3	8	6	4	2	7	18656.1231	0.0248
7	4	4	6	6	4	3	5	18656.1231	0.0006
9	1	9	9	8	1	8	8	23167.0969	-0.0357
9	1	9	8	8	1	8	7	23167.0969	-0.0396
9	1	9	10	8	1	8	9	23167.0969	-0.0547
10	1	10	10	9	1	9	9	25724.6127	-0.0298
10	1	10	9	9	1	9	8	25724.6127	-0.0333
10	1	10	11	9	1	9	10	25724.6127	-0.0457
9	1	8	10	8	1	7	9	24629.4992	-0.0724
9	1	8	8	8	1	7	7	24629.4992	-0.0628
9	1	8	9	8	1	7	8	24629.4992	-0.0543
5	1	5	5	4	0	4	4	20208.1481	-0.0333
5	1	5	4	4	0	4	3	20208.2965	0.0560
5	1	5	6	4	0	4	5	20208.2965	0.0205
6	1	6	5	5	0	5	4	22410.8103	0.0430
6	1	6	7	5	0	5	6	22410.8103	0.0257
7	1	7	7	6	0	6	6	24556.2840	0.1202
7	1	7	6	6	0	6	5	24556.2840	0.0059
7	1	7	8	6	0	6	7	24556.2840	-0.0028
9	0	9	8	8	1	8	7	18130.5561	-0.0080
9	0	9	10	8	1	8	9	18130.5561	-0.0344
11	0	11	10	10	1	10	9	24274.2606	-0.0136
11	0	11	12	10	1	10	11	24274.2606	-0.0319
11	0	11	11	10	1	10	10	24274.3881	0.0222
11	2	9	10	11	1	10	10	20788.5125	-0.0468
11	2	9	12	11	1	10	12	20788.5125	-0.0471
11	2	9	11	11	1	10	11	20788.5125	-0.0504
10	2	8	10	10	1	9	10	21119.4941	-0.0189
10	2	8	11	10	1	9	11	21119.4941	-0.0213

10	2	8	9	10	1	9	9	21119.4941	-0.0215
9	2	7	9	9	1	8	9	21503.8160	-0.0254
9	2	7	10	9	1	8	10	21503.8160	-0.0277
9	2	7	8	9	1	8	8	21503.8160	-0.0279
8	2	6	7	8	1	7	7	21920.6382	-0.0003
8	2	6	9	8	1	7	9	21920.6382	-0.0011
8	2	6	8	8	1	7	8	21920.6382	-0.0075
7	2	5	6	7	1	6	6	22349.3134	-0.0083
7	2	5	8	7	1	6	8	22349.3134	-0.0123
7	2	5	7	7	1	6	7	22349.3134	-0.0398
6	2	4	5	6	1	5	5	22770.3476	-0.0027
6	2	4	7	6	1	5	7	22770.3476	-0.0143
6	2	4	6	6	1	5	6	22770.3476	-0.0830
5	2	3	4	5	1	4	4	23165.8590	0.0359
5	2	3	6	5	1	4	6	23165.8590	0.0067
5	2	3	5	5	1	4	5	23165.8590	-0.1368
4	2	2	3	4	1	3	3	23520.0193	0.0844
4	2	2	5	4	1	3	5	23520.0193	0.0118
4	2	2	4	4	1	3	4	23520.3014	0.0114
3	2	1	2	3	1	2	2	23819.4318	0.1792
3	2	1	4	3	1	2	4	23819.4318	-0.0181
3	2	1	3	3	1	2	3	23820.0224	0.0085
2	2	0	1	2	1	1	1	24052.6877	0.0093
2	2	0	3	2	1	1	3	24053.3847	0.0111
2	2	0	2	2	1	1	3	24054.2635	-0.0645
2	2	0	2	2	1	1	1	24054.2635	0.1004
2	2	0	2	2	1	1	2	24054.6397	0.0155
2	2	1	1	2	1	2	1	24541.0213	-0.0094
2	2	1	3	2	1	2	3	24541.9173	-0.0057
2	2	1	2	2	1	2	3	24542.8786	0.0047
2	2	1	2	2	1	2	2	24543.5287	0.0002
3	2	2	3	3	1	3	2	24788.8366	0.0120
3	2	2	4	3	1	3	4	24789.1644	0.0154
3	2	2	3	3	1	3	3	24790.0923	0.0166
4	2	3	3	4	1	4	3	25119.5618	0.1430
4	2	3	5	4	1	4	5	25119.5618	-0.0231
4	2	3	4	4	1	4	4	25120.2372	0.0063
5	2	4	6	5	1	5	6	25534.0144	0.0356

1.2.14 MCA_2 A state line list in the frequency range of 75-110 GHz using SPFIT/SPCAT.

Table S14. Measured frequencies and residuals (in MHz) for the rotational transitions of MCA_2 A state in the high frequency region (75-110 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	Observed Freq. (MHz)	Residuals (MHz)
30	0	30	29	1	29	76029.3692	-0.0175
30	0	30	29	0	29	76155.7156	-0.0608
31	0	31	30	1	30	78550.8361	0.0333
31	0	31	30	0	30	78651.2060	-0.0230
32	0	32	31	1	31	81067.5735	0.0560
32	0	32	31	0	31	81147.1509	-0.0070
33	0	33	32	0	32	83643.4381	-0.0273
34	0	34	33	1	33	86090.1696	-0.0799
34	0	34	33	0	33	86140.0301	-0.0385
35	0	35	34	1	34	88597.5796	-0.0101
35	0	35	34	0	34	88636.8937	-0.0036
36	0	36	35	1	35	91102.8836	-0.0411
36	0	36	35	0	35	91133.8899	-0.0031
37	0	37	36	1	36	93606.6461	0.0038
38	0	38	37	1	37	96109.0305	-0.0237
38	0	38	37	0	37	96128.2671	0.0687
39	0	39	38	0	38	98625.4249	-0.0092
40	0	40	39	1	39	101110.9051	-0.0039
40	0	40	39	0	39	101122.6371	-0.0489
43	0	43	42	1	42	108608.7180	0.0269
43	0	43	42	0	42	108614.3812	0.0531
30	1	30	29	1	29	76129.7760	-0.0369
31	1	31	30	1	30	78630.4355	-0.0076
30	1	29	29	1	28	78744.4248	0.0747
32	1	32	31	1	31	81130.5118	-0.0479
33	1	33	32	1	32	83630.2226	-0.0198
32	1	31	31	1	30	83677.0491	0.0221
34	1	33	33	1	32	88618.9738	-0.0166
35	1	35	34	1	34	88628.4893	-0.0687
36	1	36	35	1	35	91127.3425	0.0533
36	1	35	35	1	34	93571.9091	-0.0124
37	1	37	36	1	36	93625.7634	-0.0231
38	1	38	37	1	37	96124.1426	0.0644
39	1	39	38	1	38	98622.2296	0.0425
40	1	40	39	1	39	101120.1363	0.0056
40	1	39	39	2	38	103103.6048	-0.0663
41	1	41	40	1	40	103617.9540	0.0311
41	1	40	40	1	39	105994.2636	-0.0896
42	1	42	41	1	41	106115.6166	0.0425
43	1	43	42	1	42	108613.0885	-0.0036
29	1	28	28	1	27	76279.7833	0.0297

38	1	38	37	0	37	96143.2737	0.0513
34	1	34	33	0	33	86179.3652	-0.0109
33	1	32	32	1	31	86146.6683	0.0082
35	1	34	34	1	33	91094.0974	-0.0034
38	1	37	37	1	36	98534.9756	0.0153
39	1	38	38	1	37	101019.6220	-0.0785
40	1	39	39	1	38	103506.2522	0.0049
41	1	41	40	0	40	103627.1859	0.0413
29	2	28	28	2	27	75769.5264	-0.0669
28	2	26	27	2	25	76222.2544	0.0114
29	2	27	28	2	26	78826.9482	0.0158
34	2	32	33	2	31	91534.5711	0.0345
36	2	34	35	2	33	96492.7696	0.0087
38	2	36	37	2	35	101408.3686	0.0222
28	3	25	27	3	24	76464.5946	-0.0153
37	3	35	36	3	34	97913.9709	0.0203
28	4	25	27	4	24	75012.5097	0.0076
36	3	34	35	3	33	95353.0913	-0.0034
28	4	24	27	4	23	75418.5215	-0.0020
29	4	26	28	4	25	77701.1114	0.0122
29	4	25	28	4	24	78205.0865	-0.0396
33	4	30	32	4	29	88422.5835	-0.0432
36	4	33	35	4	32	96412.7985	0.0117
36	4	32	35	4	31	98024.7429	0.0571
28	5	24	27	5	23	74944.0210	-0.0418
29	5	25	28	5	24	77644.7597	0.0273
29	5	24	28	5	23	77691.3307	-0.0197
34	5	30	33	5	29	91168.2931	0.0216
31	6	26	30	6	25	82916.4108	-0.0544
31	6	25	30	6	24	82921.4427	0.0034
38	6	33	37	6	32	101842.1978	-0.0231
33	5	29	32	5	28	88461.6998	-0.0917
36	5	31	35	5	30	96872.9491	-0.0263
31	6	25	30	6	24	82921.4438	0.0046
31	18	14	30	18	13	82608.6179	-0.0369
32	18	14	31	18	13	85274.9347	0.0117
33	18	15	32	18	14	87941.2935	-0.0375
35	18	17	34	18	16	93274.6140	0.0299
36	18	18	35	18	17	95941.4679	0.0302
37	18	19	36	18	18	98608.4554	0.0070
31	19	13	30	19	12	82605.8605	0.0697
32	19	14	31	19	13	85271.7093	0.0074
33	19	14	32	19	13	87937.7714	0.0438
36	19	17	35	19	16	95936.4612	-0.0670
37	19	18	36	19	17	98603.0919	0.0440
31	20	11	30	20	10	82603.5967	0.0317
32	20	13	31	20	12	85269.1825	0.0040
35	20	15	34	20	14	93266.5492	-0.0400

36	20	16	35	20	15	95932.5454	-0.0471
35	21	14	34	21	13	93263.8246	0.0381
36	21	15	35	21	14	95929.3954	-0.0681
37	21	16	36	21	15	98595.1458	-0.0785
36	22	14	35	22	13	95927.0526	0.0406
37	22	15	36	22	14	98592.4858	0.0065
32	2	30	31	2	29	86512.0453	-0.0165
35	2	34	34	2	33	90897.1258	-0.0670
37	2	35	36	2	34	98954.4889	0.0616
39	2	37	38	2	36	103857.3490	0.0452
40	2	38	39	2	37	106303.8175	0.0301
40	3	37	39	3	36	109040.3698	0.0527
41	3	39	40	3	38	108094.9598	0.0165
40	3	38	39	3	37	105558.3477	-0.0020
39	3	37	38	3	36	103016.2760	0.0383
37	3	34	36	3	33	101170.7747	0.0713
37	3	35	36	3	34	97913.9709	0.0203
34	3	31	33	3	30	93098.0819	0.0894
33	3	31	32	3	30	87628.4368	-0.0221
32	3	29	31	3	28	87616.3598	0.0149
33	3	30	32	3	29	90366.3697	0.0153
30	4	26	29	4	25	81004.7285	-0.0360
31	4	27	30	4	26	83817.2357	-0.0122
32	4	29	31	4	28	85748.4565	0.0667
39	4	36	38	4	35	104344.1668	0.0009
31	5	26	30	5	25	83134.0306	0.0388
32	5	28	31	5	27	85755.8102	-0.0615
32	5	27	31	5	26	85864.9688	-0.0279
33	5	28	32	5	27	88603.5004	-0.0016
35	5	31	34	5	30	93874.8801	-0.0309
35	5	30	34	5	29	94106.5683	0.0128
38	5	34	37	5	33	101991.0380	-0.0453
39	5	35	38	5	34	104693.4358	-0.0231
37	6	31	36	6	30	99166.0010	-0.0020
39	6	33	38	6	32	104611.9809	0.0236
33	6	28	32	6	27	88313.6316	0.0333
32	6	27	31	6	26	85614.0186	0.0198
29	7	23	28	7	22	77449.1135	0.0174
29	7	22	28	7	21	77449.1135	-0.0630
30	7	24	29	7	23	80134.2671	0.0316
30	7	23	29	7	22	80134.2671	-0.0938
39	7	33	38	7	32	104374.7727	0.0640
39	7	32	38	7	31	104378.5285	0.0620
29	8	22	28	8	21	77398.9258	0.0030
29	8	21	28	8	20	77398.9258	0.0011
30	8	23	29	8	22	80078.5764	-0.0039
30	8	22	29	8	21	80078.5764	-0.0071
31	8	24	30	8	23	82759.2832	-0.0604

31	8	23	30	8	22	82759.2832	-0.0657
32	8	25	31	8	24	85441.2997	0.0465
32	8	24	31	8	23	85441.2997	0.0380
33	8	26	32	8	25	88124.3422	-0.0082
33	8	25	32	8	24	88124.3422	-0.0217
34	8	27	33	8	26	90808.6648	-0.0122
34	8	26	33	8	25	90808.6648	-0.0334
35	8	28	34	8	27	93494.2697	-0.0061
35	8	27	34	8	26	93494.2697	-0.0389
36	8	29	35	8	28	96181.1979	0.0080
36	8	28	35	8	27	96181.1979	-0.0424
37	8	30	36	8	29	98869.5148	0.0511
37	8	29	36	8	28	98869.5148	-0.0249
40	8	33	39	8	32	106942.9707	0.0749
40	8	32	39	8	31	106942.9707	-0.1698
29	9	21	28	9	20	77365.1047	-0.0341
29	9	20	28	9	19	77365.1047	-0.0341
30	9	21	29	9	20	80041.0870	-0.0248
30	9	22	29	9	21	80041.0870	-0.0247
31	9	23	30	9	22	82717.9214	-0.0043
31	9	22	30	9	21	82717.9214	-0.0044
32	9	24	31	9	23	85395.5937	-0.0171
32	9	23	31	9	22	85395.5937	-0.0172
33	9	25	32	9	24	88074.1905	-0.0060
33	9	24	32	9	23	88074.1905	-0.0063
34	9	26	33	9	25	90753.6971	-0.0166
34	9	25	33	9	24	90753.6971	-0.0172
35	9	27	34	9	26	93434.1838	-0.0093
35	9	26	34	9	25	93434.1838	-0.0101
36	9	28	35	9	27	96115.6518	-0.0139
36	9	27	35	9	26	96115.6518	-0.0153
37	9	29	36	9	28	98798.1475	-0.0159
37	9	28	36	9	27	98798.1475	-0.0181
38	9	30	37	9	29	101481.6796	-0.0389
38	9	29	37	9	28	101481.6796	-0.0424
39	9	31	38	9	30	104166.4060	0.0424
39	9	30	38	9	29	104166.4060	0.0369
40	9	32	39	9	31	106852.1219	-0.0105
40	9	31	39	9	30	106852.1219	-0.0189
29	10	19	28	10	18	77341.3224	-0.0319
29	10	20	28	10	19	77341.3224	-0.0319
30	10	20	29	10	19	80014.7255	-0.0053
30	10	21	29	10	20	80014.7255	-0.0053
31	10	21	30	10	20	82688.7221	-0.0421
31	10	22	30	10	21	82688.7221	-0.0421
32	10	22	31	10	21	85363.4544	-0.0227
32	10	23	31	10	22	85363.4544	-0.0227
33	10	23	32	10	22	88038.8515	-0.0409

33	10	24	32	10	23	88038.8515	-0.0409
34	10	24	33	10	23	90715.0757	0.0425
34	10	25	33	10	24	90715.0757	0.0425
35	10	25	34	10	24	93391.9241	0.0017
35	10	26	34	10	25	93391.9241	0.0017
36	10	27	35	10	26	96069.5891	0.0054
36	10	26	35	10	25	96069.5891	0.0054
37	10	27	36	10	26	98748.0904	0.0498
37	10	28	36	10	27	98748.0904	0.0498
38	10	28	37	10	27	101427.3036	-0.0135
38	10	29	37	10	28	101427.3036	-0.0134
40	10	31	39	10	30	106788.4341	0.0085
40	10	30	39	10	29	106788.4341	0.0083
29	11	18	28	11	17	77324.0114	-0.0255
29	11	19	28	11	18	77324.0114	-0.0255
30	11	19	29	11	18	79995.5595	0.0456
30	11	20	29	11	19	79995.5595	0.0456
31	11	20	30	11	19	82667.5255	0.0117
31	11	21	30	11	20	82667.5255	0.0117
32	11	21	31	11	20	85340.1395	0.0852
32	11	22	31	11	21	85340.1395	0.0852
33	11	22	32	11	21	88013.1917	0.0385
33	11	23	32	11	22	88013.1917	0.0385
34	11	23	33	11	22	90686.8697	0.0411
34	11	24	33	11	23	90686.8697	0.0411
35	11	24	34	11	23	93361.0753	-0.0232
35	11	25	34	11	24	93361.0753	-0.0232
38	11	27	37	11	26	101387.6229	-0.0341
38	11	28	37	11	27	101387.6229	-0.0341
39	11	28	38	11	27	104064.4773	-0.0103
39	11	29	38	11	28	104064.4773	-0.0103
41	11	30	40	11	29	109420.2094	-0.0180
41	11	31	40	11	30	109420.2094	-0.0180
29	12	17	28	12	16	77311.0970	-0.0049
29	12	18	28	12	17	77311.0970	-0.0049
30	12	18	29	12	17	79981.2297	0.0813
30	12	19	29	12	18	79981.2297	0.0813
31	12	19	30	12	18	82651.6415	0.0247
31	12	20	30	12	19	82651.6415	0.0247
33	12	21	32	12	20	87993.8866	0.0102
33	12	22	32	12	21	87993.8866	0.0102
35	12	23	34	12	22	93337.9371	-0.0579
35	12	24	34	12	23	93337.9371	-0.0579
36	12	24	35	12	23	96010.8132	0.0258
36	12	25	35	12	24	96010.8132	0.0258
37	12	25	36	12	24	98684.0552	-0.0324
37	12	26	36	12	25	98684.0552	-0.0324
38	12	26	37	12	25	101357.8844	-0.0260

38	12	27	37	12	26	101357.8844	-0.0260
40	12	28	39	12	27	106707.1348	-0.0473
40	12	29	39	12	28	106707.1348	-0.0473
29	13	16	28	13	15	77301.3329	0.0815
29	13	17	28	13	16	77301.3329	0.0815
32	13	19	31	13	18	85309.2231	0.0966
32	13	20	31	13	19	85309.2231	0.0966
34	13	21	33	13	20	90649.4716	-0.0543
34	13	22	33	13	21	90649.4716	-0.0543
35	13	22	34	13	21	93320.3207	0.0156
35	13	23	34	13	22	93320.3207	0.0156
36	13	23	35	13	22	95991.4819	-0.0042
36	13	24	35	13	23	95991.4819	-0.0042
38	13	25	37	13	24	101335.1117	0.0115
38	13	26	37	13	25	101335.1117	0.0115
29	14	15	28	14	14	77293.6954	0.0537
29	14	16	28	14	15	77293.6954	0.0537
33	14	19	32	14	18	87967.6661	-0.0196
33	14	20	32	14	19	87967.6661	-0.0196
35	14	21	34	14	20	93306.4814	-0.0529
35	14	22	34	14	21	93306.4814	-0.0529
30	15	16	29	15	15	79955.1422	0.0502
30	15	15	29	15	14	79955.1422	0.0502
33	15	18	32	15	17	87958.6788	-0.0043
33	15	19	32	15	18	87958.6810	-0.0020
35	15	20	34	15	19	93295.6712	-0.0072
35	15	21	34	15	20	93295.6712	-0.0072
38	15	23	37	15	22	101303.1586	-0.0700
38	15	24	37	15	23	101303.1586	-0.0700
40	15	25	39	15	24	106642.9698	-0.0877
40	15	26	39	15	25	106642.9698	-0.0877
29	16	13	28	16	12	77283.0859	0.0397
29	16	14	28	16	13	77283.0859	0.0397
33	16	17	32	16	16	87951.5794	0.0326
33	16	18	32	16	17	87951.5794	0.0326
37	16	21	36	16	20	98623.4849	0.0501
37	16	22	36	16	21	98623.4849	0.0501
39	16	23	38	16	22	103960.7750	-0.0017
39	16	24	38	16	23	103960.7750	-0.0017
40	16	24	39	16	23	106629.8656	0.0461
40	16	25	39	16	24	106629.8656	0.0461
41	16	25	40	16	24	109299.0475	-0.0712
41	16	26	40	16	25	109299.0475	-0.0712
41	17	25	40	17	24	109287.4934	-0.0569
41	17	24	40	17	23	109287.4934	-0.0569
38	17	22	37	17	21	101283.0089	0.0741
38	17	21	37	17	20	101283.0089	0.0741
37	17	21	36	17	20	98615.1800	0.0409

37	17	20	36	17	19	98615.1800	0.0409
35	17	19	34	17	18	93280.1751	0.0449
35	17	18	34	17	17	93280.1751	0.0449
33	17	17	32	17	16	87945.8825	0.0194
33	17	16	32	17	15	87945.8825	0.0194
32	17	16	31	17	15	85278.9558	-0.0389
32	17	15	31	17	14	85278.9558	-0.0389
30	17	14	29	17	13	79945.7583	-0.0031
38	22	16	37	22	15	101258.0199	0.0056
38	22	17	37	22	16	101258.0199	0.0056

1.2.15 13C1 MCA_1 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S15: Measured frequencies and residuals (in MHz) for the rotational transitions of 13C1 MCA_1 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	Ka	Kc	F	J'	Ka'	Kc'	F'	Observed Freq. (MHz)	Residuals (MHz)
1	0	1	1	0	0	0	1	3178.4504	-0.0135
1	0	1	2	0	0	0	1	3178.7673	-0.0275
1	0	1	0	0	0	0	1	3179.2902	-0.0011
2	1	2	2	1	1	1	1	5903.5115	0.0021
2	1	2	3	1	1	1	2	5903.8821	0.0003
2	1	2	1	1	1	1	1	5904.4920	0.0144
2	0	2	2	1	0	1	2	6311.7983	-0.0041
2	0	2	1	1	0	1	0	6311.9448	-0.0010
2	0	2	2	1	0	1	1	6312.1557	0.0224
2	0	2	3	1	0	1	2	6312.2069	-0.0068
2	0	2	1	1	0	1	1	6312.7675	-0.0056
2	1	1	1	1	1	0	1	6810.4655	0.0162
2	1	1	2	1	1	0	1	6810.8637	-0.0023
2	1	1	3	1	1	0	2	6811.1735	-0.0055
2	1	1	2	1	1	0	2	6811.4461	-0.0007
2	1	1	1	1	1	0	0	6811.9035	0.0019
3	1	3	2	2	1	2	1	8828.6043	-0.0049
3	1	3	3	2	1	2	2	8828.6043	0.0455
3	1	3	4	2	1	2	3	8828.6750	-0.0159
2	1	2	2	1	0	1	1	9073.8227	-0.0048
2	1	2	1	1	0	1	0	9073.9701	0.0018
2	1	2	3	1	0	1	2	9074.1251	0.0061
3	0	3	2	2	0	2	1	9357.8770	-0.0475
3	0	3	3	2	0	2	2	9357.8770	0.0027
3	0	3	4	2	0	2	3	9357.9764	0.0022

3	2	2	2	2	2	1	2	9535.8758	0.0009
3	2	2	4	2	2	1	3	9536.2290	-0.0004
3	2	2	2	2	2	1	1	9536.4269	0.0006
3	2	1	3	2	2	0	2	9714.1722	0.0076
3	2	1	4	2	2	0	3	9714.4404	0.0078
3	2	1	2	2	2	0	1	9714.6288	0.0179
3	1	2	3	2	1	1	2	10186.7265	0.0006
3	1	2	4	2	1	1	3	10186.8248	-0.0030
3	1	2	2	2	1	1	1	10186.9198	0.0013
4	2	3	4	3	2	2	3	12679.3925	0.0037
4	2	3	5	3	2	2	4	12679.5348	-0.0186
4	1	3	4	3	1	2	3	13522.5211	0.0206
4	1	3	5	3	1	2	4	13522.5211	-0.0466
5	1	4	4	4	1	3	3	16798.4401	-0.0229
5	1	4	6	4	1	3	5	16798.4401	-0.0043
6	1	5	5	5	1	4	4	19989.9670	0.0118
6	1	5	7	5	1	4	6	19989.9670	0.0256
6	2	4	6	5	2	3	5	20112.0027	-0.0092
6	2	4	7	5	2	3	6	20112.0027	0.0130
6	2	4	5	5	2	3	4	20112.0027	0.0135
7	1	7	8	6	1	6	7	20222.1608	-0.0092
7	1	7	6	6	1	6	5	20222.1608	0.0075
7	1	7	7	6	1	6	6	20222.1608	0.0359
7	0	7	6	6	0	6	5	20510.3351	-0.0071
7	0	7	8	6	0	6	7	20510.3351	-0.0157
7	1	6	6	6	1	5	5	23070.5670	-0.0068
7	1	6	8	6	1	5	7	23070.5670	0.0049
7	2	5	7	6	2	4	6	23627.0602	-0.0148
7	2	5	6	6	2	4	5	23627.0602	-0.0032
7	2	5	8	6	2	4	7	23627.0602	-0.0022

1.2.16 13C3 MCA_1 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S16: Measured frequencies and residuals (in MHz) for the rotational transitions of 13C3 MCA_1 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
1	0	1	2	0	0	0	1	3222.3269	0.0067
2	1	2	2	1	1	1	2	5984.7563	0.0085
2	1	2	2	1	1	1	1	5984.9875	0.0044
2	1	2	3	1	1	1	2	5985.3905	0.0037
2	1	2	1	1	1	1	0	5985.3905	0.0016
2	0	2	2	1	0	1	2	6398.3371	0.0005
2	0	2	1	1	0	1	0	6398.4884	0.0038
2	0	2	2	1	0	1	1	6398.7248	0.0271
2	0	2	3	1	0	1	2	6398.7812	0.0012
2	0	2	1	1	0	1	1	6399.3859	-0.0016
2	1	1	1	1	1	0	1	6903.0208	-0.0083
2	1	1	2	1	1	0	1	6903.4199	-0.0013
2	1	1	3	1	1	0	2	6903.7676	0.0021
2	1	1	2	1	1	0	2	6904.0144	-0.0033
2	1	1	1	1	1	0	0	6904.5199	-0.0003
3	1	3	3	2	1	2	2	8950.5025	-0.0077
3	1	3	2	2	1	2	1	8950.5710	0.0017
3	1	3	4	2	1	2	3	8950.6399	-0.0114
3	0	3	3	2	0	2	2	9486.5423	-0.0073
3	0	3	2	2	0	2	1	9486.5423	-0.0519
3	2	2	2	2	2	1	2	9666.3968	-0.0070
3	2	2	2	2	2	1	3	9666.7897	-0.0010
3	2	1	3	2	2	0	2	9846.5966	0.0157
3	2	1	4	2	2	0	3	9846.8847	0.0032
3	2	1	2	2	2	0	1	9847.0964	0.0185
4	0	4	5	3	0	3	4	12456.2860	-0.0162
4	0	4	3	3	0	3	2	12456.2860	0.0047
4	2	3	4	3	2	2	3	12853.0777	0.0056
4	2	3	5	3	2	2	4	12853.2361	-0.0142
4	2	2	5	3	2	1	4	13285.6882	-0.0268
4	2	2	4	3	2	1	3	13285.6882	0.0454
4	2	2	3	3	2	1	2	13285.6882	-0.0586
5	0	5	6	4	0	4	5	15307.1357	-0.0085
5	0	5	4	4	0	4	3	15307.1357	0.0029
5	2	3	6	4	2	2	5	16812.1448	-0.0063
5	2	3	5	4	2	2	4	16812.1448	-0.0077
5	2	3	4	4	2	2	3	16812.1448	-0.0097
6	0	6	7	5	0	5	6	18071.6050	0.0399
6	0	6	5	5	0	5	4	18071.6050	0.0495
6	2	5	5	5	2	4	4	19128.6345	0.0137

6	2	5	7	5	2	4	6	19128.6345	0.0172
6	1	5	7	5	1	4	6	20263.1562	0.0217
6	1	5	5	5	1	4	4	20263.1562	0.0089
6	2	4	6	5	2	3	5	20384.8740	0.0022
6	2	4	7	5	2	3	6	20384.8740	0.0202
6	2	4	5	5	2	3	4	20384.8740	0.0207
7	1	7	6	6	1	6	5	20502.4275	-0.0186
7	1	7	7	6	1	6	6	20502.4275	0.0099
7	3	4	8	6	3	3	7	23108.9856	0.0218
7	3	4	6	6	3	3	5	23108.9856	0.0203
7	3	4	7	6	3	3	6	23108.9856	0.0344
8	0	8	9	7	0	7	8	23511.6492	-0.0386
8	0	8	8	7	0	7	7	23511.6492	0.0275
8	0	8	7	7	0	7	6	23511.6492	-0.0292
7	2	5	6	6	2	4	5	23947.7173	-0.0288
7	2	5	8	6	2	4	7	23947.7173	-0.0281
7	2	5	7	6	2	4	6	23947.7173	-0.0382

1.2.17 13C5 MCA_1 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S17: Measured frequencies and residuals (in MHz) for the rotational transitions of 13C5 MCA_1 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
1	0	1	1	0	0	0	1	3214.8908	0.0068
1	0	1	2	0	0	0	1	3215.2335	0.0022
1	0	1	0	0	0	0	1	3215.7291	-0.0229
2	1	2	2	1	1	1	2	5968.9662	-0.0039
2	1	2	2	1	1	1	1	5969.2163	0.0037
2	1	2	1	1	1	1	0	5969.6075	0.0184
2	1	2	1	1	1	1	1	5970.2051	0.0098
2	0	2	3	1	0	1	2	6383.7950	0.0093
2	1	1	1	1	1	0	1	6890.4686	0.0022
2	1	1	2	1	1	0	1	6890.8681	-0.0023
2	1	1	1	1	1	0	2	6891.0569	0.0009
2	1	1	3	1	1	0	2	6891.2024	0.0022
2	1	1	2	1	1	0	2	6891.4566	-0.0034
2	1	1	1	1	1	0	0	6891.9489	0.0085
3	1	3	3	2	1	2	2	8926.3662	-0.0061
3	1	3	2	2	1	2	1	8926.4335	0.0059
3	1	3	4	2	1	2	3	8926.5058	-0.0037
3	0	3	3	2	0	2	2	9462.1537	0.0075
3	0	3	4	2	0	2	3	9462.2585	0.0110
3	2	2	3	2	2	1	2	9645.1680	0.0062
3	2	2	4	2	2	1	3	9645.5385	0.0047
3	2	1	3	2	2	0	2	9828.4906	0.0082
3	2	1	4	2	2	0	3	9828.7749	0.0080
3	2	1	2	2	2	0	1	9828.9719	0.0172
3	1	2	3	2	1	1	2	10305.8669	-0.0051
3	1	2	4	2	1	1	3	10305.9781	-0.0009
3	1	2	2	2	1	1	1	10306.0630	-0.0068
4	0	4	5	3	0	3	4	12420.8781	-0.0002
4	0	4	3	3	0	3	2	12420.8781	0.0192
4	2	3	4	3	2	2	4	12824.1011	-0.0022
4	2	3	5	3	2	2	4	12824.2533	-0.0221
4	2	2	5	3	2	1	4	13263.8301	0.0197
4	2	2	3	3	2	1	2	13263.8301	-0.0104
4	1	3	3	3	1	2	2	13679.6001	-0.0599
4	1	3	4	3	1	2	3	13679.6001	0.0420
4	1	3	5	3	1	2	4	13679.6001	-0.0278
5	1	5	4	4	1	4	3	14748.3848	-0.0116
5	1	5	5	4	1	4	4	14748.3848	0.0174
5	1	5	6	4	1	4	5	14748.3848	-0.0445
5	0	5	4	4	0	4	3	15259.9511	-0.0164

5	0	5	6	4	0	4	5	15259.9511	-0.0270
5	1	4	6	4	1	3	5	16991.5041	-0.0119
5	1	4	4	4	1	3	3	16991.5041	-0.0300
6	0	6	7	5	0	5	6	18013.3545	0.0220
6	0	6	5	5	0	5	4	18013.3545	0.0311
6	2	5	7	5	2	4	6	19082.5105	-0.0206
6	2	5	5	5	2	4	4	19082.5105	-0.0241
6	1	5	7	5	1	4	6	20216.3505	0.0384
6	1	5	5	5	1	4	4	20216.3505	0.0250
6	2	4	7	5	2	3	6	20354.2366	0.0043
6	2	4	6	5	2	3	5	20354.2366	-0.0153
6	2	4	5	5	2	3	4	20354.2366	0.0046
7	0	7	8	6	0	6	7	20727.1626	-0.0039
7	0	7	6	6	0	6	5	20727.1626	0.0053
7	3	5	8	6	3	4	7	22732.0594	0.0125
7	3	5	6	6	3	4	5	22732.0594	0.0054
7	3	4	8	6	3	3	7	23071.3368	-0.0053
7	3	4	7	6	3	3	6	23071.3368	0.0036
7	3	4	6	6	3	3	5	23071.3368	-0.0064
7	1	6	8	6	1	5	7	23326.8479	0.0375
7	1	6	6	6	1	5	5	23326.8479	0.0262
8	0	8	7	7	0	7	6	23435.2155	0.0096
8	0	8	9	7	0	7	8	23435.2155	0.0004
7	2	5	6	6	2	4	5	23909.6198	-0.0089
7	2	5	8	6	2	4	7	23909.6198	-0.0078
7	2	5	7	6	2	4	6	23909.6198	-0.0182

1.2.18 13C6 MCA_1 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S18: Measured frequencies and residuals (in MHz) for the rotational transitions of 13C6 MCA_1 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
1	0	1	1	0	0	0	1	3189.8910	-0.0150
1	0	1	2	0	0	0	1	3190.2349	-0.0232
1	0	1	0	0	0	0	1	3190.7827	-0.0034
2	1	2	2	1	1	1	1	5931.0634	-0.0045
2	1	2	1	1	1	1	0	5931.3752	-0.0122
2	1	2	3	1	1	1	2	5931.4646	-0.0033
2	0	2	2	1	0	1	2	6336.6061	0.0083
2	0	2	3	1	0	1	2	6337.0413	0.0003
2	0	2	1	1	0	1	1	6337.6338	-0.0056
2	1	1	2	1	1	0	1	6829.1153	0.0034
2	1	1	3	1	1	0	2	6829.4523	0.0112
2	1	1	2	1	1	0	2	6829.7806	-0.0040
3	1	3	3	2	1	2	2	8870.9951	-0.0199
3	1	3	2	2	1	2	1	8871.0644	0.0025
3	1	3	4	2	1	2	3	8871.1425	-0.0170
3	0	3	3	2	0	2	2	9399.5722	0.0077
3	0	3	4	2	0	2	3	9399.6742	-0.0055
3	2	1	4	2	2	0	3	9741.5111	0.0210
3	2	1	2	2	2	0	1	9741.7004	0.0225
3	1	2	3	2	1	1	2	10215.4285	0.0028
3	1	2	4	2	1	1	3	10215.5404	0.0064
4	1	4	4	3	1	3	3	11783.2217	0.0222
4	1	4	3	3	1	3	2	11783.2217	-0.0085
4	0	4	3	3	0	3	2	12349.2522	-0.0025
4	0	4	5	3	0	3	4	12349.2522	-0.0199
4	2	2	4	3	2	1	3	13138.1210	0.0254
4	2	2	5	3	2	1	4	13138.1210	-0.0261
4	1	3	5	3	1	2	4	13563.5684	-0.0189
5	1	5	6	4	1	4	5	14664.0435	0.0181
5	0	5	4	4	0	4	3	15183.4781	0.0164
5	0	5	6	4	0	4	5	15183.4781	0.0075
5	2	3	6	4	2	2	5	16620.6246	-0.0250
5	2	3	4	4	2	2	3	16620.6246	-0.0270
6	2	5	7	5	2	4	6	18946.9259	0.0019
6	2	5	5	5	2	4	4	18946.9259	-0.0022
6	3	4	7	5	3	3	6	19312.6331	0.0223
6	3	4	5	5	3	3	4	19312.6331	0.0059
6	3	3	7	5	3	2	6	19453.7784	0.0362
6	3	3	5	5	3	2	4	19453.7784	0.0250
6	1	5	5	5	1	4	4	20065.7866	-0.0032

6	1	5	7	5	1	4	6	20065.7866	0.0141
6	2	4	5	5	2	3	4	20151.6140	0.0272
6	2	4	7	5	2	3	6	20151.6140	0.0262
6	2	4	6	5	2	3	5	20151.6140	-0.0079
7	0	7	6	6	0	6	5	20635.9421	0.0322
7	0	7	8	6	0	6	7	20635.9421	0.0234
7	3	4	7	6	3	3	6	22851.6536	-0.0014
7	3	4	8	6	3	3	7	22851.6536	-0.0031
7	3	4	6	6	3	3	5	22851.6536	-0.0036
8	1	8	8	7	1	7	7	23129.1669	-0.0252
7	1	6	8	6	1	5	7	23171.2253	-0.0124
7	1	6	6	6	1	5	5	23171.2253	-0.0270
8	0	8	8	7	0	7	7	23331.3243	0.0444
8	0	8	7	7	0	7	6	23331.3243	-0.0259
8	0	8	9	7	0	7	8	23331.3243	-0.0352
7	2	5	8	6	2	4	7	23677.8947	0.0117
7	2	5	6	6	2	4	5	23677.8947	0.0106
7	2	5	7	6	2	4	6	23677.8947	-0.0100

1.2.19 15N7 MCA_1 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S19: Measured frequencies and residuals (in MHz) for the rotational transitions of 15N7 MCA_1 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	J'	K_a'	K_c'	Observed Freq. (MHz)	Residuals (MHz)
2	1	2	1	1	1	5858.2797	0.0023
2	0	2	1	0	1	6256.7530	-0.0015
2	1	1	1	1	0	6738.8428	-0.0026
3	1	3	2	1	2	8762.3771	-0.0202
3	0	3	2	0	2	9283.0142	-0.0098
3	2	1	2	2	0	9612.5880	0.0026
3	1	2	2	1	1	10080.7299	-0.0082
4	1	4	3	1	3	11639.8452	0.0034
4	0	4	3	0	3	12199.8292	-0.0077
4	2	3	3	2	2	12564.4230	0.0082
4	2	2	3	2	1	12961.4766	-0.0059
4	1	3	3	1	2	13386.0505	0.0051
5	1	5	4	1	4	14486.8536	0.0107
5	0	5	4	0	4	15003.9953	0.0077
5	1	4	4	1	3	16636.7359	0.0159
6	2	5	5	2	4	18708.3267	-0.0103
6	3	4	5	3	3	19061.8263	0.0108
6	3	3	5	3	2	19195.7414	0.0115
6	1	5	5	1	4	19810.5162	-0.0182
6	2	4	5	2	3	19876.7407	-0.0121
7	0	7	6	0	6	20396.9520	0.0177
7	3	5	6	3	4	22254.8806	-0.0131
7	3	4	6	3	3	22544.2040	0.0138
8	1	8	7	1	7	22854.9575	-0.0155
7	1	6	6	1	5	22882.9209	-0.0112

1.2.20 13C1 MCA_2 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S20: Measured frequencies and residuals (in MHz) for the rotational transitions of 13C1 MCA_2 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
2	0	2	2	1	0	1	1	5219.6994	0.0218
2	0	2	3	1	0	1	2	5219.7578	0.0135
3	1	3	3	2	1	2	2	7595.2506	0.0042
3	1	3	2	2	1	2	1	7595.4664	-0.0116
3	1	3	4	2	1	2	3	7595.5252	0.0074
3	0	3	2	2	0	2	1	7823.6559	0.0066
3	0	3	4	2	0	2	3	7823.7992	-0.0319
3	0	3	3	2	0	2	2	7823.7992	0.0086
3	1	2	3	2	1	1	2	8067.4378	0.0104
3	1	2	4	2	1	1	3	8067.6661	-0.0194
3	1	2	2	2	1	1	1	8067.6661	-0.0492
4	0	4	5	3	0	3	4	10421.1061	0.0245
1	1	1	2	0	0	0	1	10654.4994	0.0110
1	1	1	1	0	0	0	1	10654.7564	-0.0061
5	1	5	4	4	1	4	3	12651.5505	-0.0353
5	1	5	5	4	1	4	4	12651.5505	-0.0079
5	0	5	5	4	0	4	4	13009.2750	0.0352
5	0	5	6	4	0	4	5	13009.2750	0.0104
2	1	2	1	1	0	1	0	13107.1398	-0.0129
2	1	2	3	1	0	1	2	13108.1150	-0.0024
2	1	2	2	1	0	1	1	13108.3462	-0.0018
2	1	2	1	1	0	1	1	13109.3635	-0.0042
3	1	3	2	2	0	2	1	15483.6926	0.0065
3	1	3	3	2	0	2	2	15483.9077	-0.0091
3	1	3	4	2	0	2	3	15483.9077	0.0167
6	0	6	7	5	0	5	6	15586.2288	-0.0354
6	0	6	6	5	0	5	5	15586.2288	-0.0129
6	0	6	5	5	0	5	4	15586.2288	-0.0026
7	2	5	6	6	2	4	5	18385.5117	0.0112
7	2	5	8	6	2	4	7	18385.5117	0.0039
7	1	6	7	6	1	5	6	18796.1567	0.0011
7	1	6	8	6	1	5	7	18796.1567	-0.0275
7	1	6	6	6	1	5	5	18796.1567	-0.0126
8	1	8	8	7	1	7	7	20214.9191	0.0009
8	1	8	7	7	1	7	6	20214.9191	-0.0039
8	1	8	9	7	1	7	8	20214.9191	-0.0228
8	0	8	9	7	0	7	8	20699.3849	-0.0086
8	0	8	7	7	0	7	6	20699.3849	0.0088

8	0	8	8	7	0	7	7	20699.3849	0.0127
8	2	7	8	7	2	6	7	20859.7090	0.0198
8	2	7	9	7	2	6	8	20859.7090	-0.0380
8	2	7	7	7	2	6	6	20859.7090	-0.0302
8	2	6	7	7	2	5	6	21047.8622	0.0246
8	2	6	9	7	2	5	8	21047.8622	0.0159
8	2	6	8	7	2	5	7	21047.8622	0.0594
6	1	6	7	5	0	5	6	22181.9416	0.0018
6	1	6	5	5	0	5	4	22181.9416	0.0187
9	1	9	10	8	1	8	9	22728.9101	-0.0536
9	1	9	8	8	1	8	7	22728.9101	-0.0385
9	1	9	9	8	1	8	8	22728.9101	-0.0348
9	2	8	10	8	2	7	9	23457.3890	-0.0263
9	2	8	8	8	2	7	7	23457.3890	-0.0186
9	2	8	9	8	2	7	8	23457.3890	0.0163
7	1	7	8	6	0	6	7	24292.8394	-0.0023
7	1	7	6	6	0	6	5	24292.8394	0.0059
10	1	10	9	9	1	9	8	25239.0270	0.0416
10	1	10	10	9	1	9	9	25239.0270	0.0450
10	1	10	11	9	1	9	10	25239.0270	0.0292

1.2.21 13C3 MCA_2 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S21: Measured frequencies and residuals (in MHz) for the rotational transitions of 13C3 MCA_2 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
2	0	2	2	1	0	1	1	5322.0875	0.0174
2	0	2	3	1	0	1	2	5322.1431	0.0022
3	1	3	3	2	1	2	2	7739.7553	-0.0009
3	1	3	2	2	1	2	1	7739.9783	-0.0094
3	1	3	4	2	1	2	3	7740.0303	-0.0113
3	0	3	2	2	0	2	1	7976.7586	-0.0059
3	0	3	4	2	0	2	3	7976.9090	-0.0440
3	0	3	3	2	0	2	2	7976.9090	0.0005
4	0	4	3	3	0	3	2	10624.2602	-0.0195
4	0	4	4	3	0	3	3	10624.3738	0.0405
4	0	4	5	3	0	3	4	10624.3738	0.0065
5	1	5	4	4	1	4	3	12891.8250	-0.0062
5	1	5	5	4	1	4	4	12891.8250	0.0210
7	1	7	6	6	1	6	5	18032.2804	0.0141
7	1	7	8	6	1	6	7	18032.2804	-0.0126
7	1	7	7	6	1	6	6	18032.2804	0.0219
7	0	7	6	6	0	6	5	18498.9352	0.0585
7	0	7	8	6	0	6	7	18498.9352	0.0347
7	0	7	7	6	0	6	6	18498.9352	0.0625
7	2	6	8	6	2	5	7	18616.5702	0.0212
7	2	6	6	6	2	5	5	18616.5702	0.0277
7	2	5	6	6	2	4	5	18753.3820	0.0089
7	2	5	8	6	2	4	7	18753.3820	0.0010
7	3	5	8	6	3	4	7	18654.9559	-0.0341
7	3	5	6	6	3	4	5	18654.9559	-0.0501
7	3	4	8	6	3	3	7	18657.9467	0.0091
7	3	4	6	6	3	3	5	18657.9467	-0.0068
8	1	8	7	7	1	7	6	20597.1017	0.0046
8	1	8	9	7	1	7	8	20597.1017	-0.0163
8	1	8	8	7	1	7	7	20597.1017	0.0103
8	0	8	7	7	0	7	6	21094.5519	0.0476
8	0	8	9	7	0	7	8	21094.5519	0.0299
8	0	8	8	7	0	7	7	21094.5519	0.0581
8	2	7	8	7	2	6	7	21267.7118	0.0377
8	2	7	7	7	2	6	6	21267.7118	-0.0155
8	2	7	9	7	2	6	8	21267.7118	-0.0236
8	2	6	9	7	2	5	8	21471.0713	-0.0141
8	2	6	8	7	2	5	7	21471.0713	0.0261
8	2	6	7	7	2	5	6	21471.0713	-0.0047
8	1	7	9	7	1	6	8	21899.5830	-0.0289

8	1	7	7	7	1	6	6	21899.5830	-0.0179
8	1	7	8	7	1	6	7	21899.5830	-0.0047
6	1	6	5	5	0	5	4	22406.4792	0.0022
6	1	6	7	5	0	5	6	22406.4792	-0.0051
9	1	9	10	8	1	8	9	23157.8526	-0.0537
9	1	9	9	8	1	8	8	23157.8526	-0.0321
9	1	9	8	8	1	8	7	23157.8526	-0.0371
9	0	9	9	8	0	8	8	23673.2293	0.0143
9	0	9	10	8	0	8	9	23673.2293	-0.0144
9	0	9	8	8	0	8	7	23673.2293	-0.0008

1.2.22 13C5 MCA_2 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S22: Measured frequencies and residuals (in MHz) for the rotational transitions of 13C5 MCA_2 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
2	0	2	3	1	0	1	2	5311.3158	0.0023
3	1	3	3	2	1	2	2	7720.3975	-0.0085
3	1	3	2	2	1	2	1	7720.6166	-0.0221
3	1	3	4	2	1	2	3	7720.6700	-0.0075
3	0	3	2	2	0	2	1	7960.2374	-0.0205
3	0	3	3	2	0	2	2	7960.3943	-0.0046
3	0	3	4	2	0	2	3	7960.3943	-0.0454
3	1	2	3	2	1	1	2	8217.4774	-0.0065
3	1	2	4	2	1	1	3	8217.7291	-0.0133
3	1	2	2	2	1	1	1	8217.7291	-0.0420
1	1	1	0	0	0	0	1	10534.7927	-0.0094
1	1	1	2	0	0	0	1	10535.2102	-0.0115
1	1	1	1	0	0	0	1	10535.4982	-0.0032
4	0	4	4	3	0	3	3	10601.8415	0.0307
4	0	4	5	3	0	3	4	10601.8415	0.0007
4	1	3	4	3	1	2	3	10953.7259	0.0045
4	1	3	3	3	1	2	2	10953.8314	0.0170
4	1	3	5	3	1	2	4	10953.8314	-0.0053
2	1	2	1	1	0	1	0	13025.5204	0.0080
2	1	2	3	1	0	1	2	13026.5003	0.0193
2	1	2	2	1	0	1	1	13026.7233	0.0059
5	0	5	5	4	0	4	4	13233.0180	0.0368
5	0	5	6	4	0	4	5	13233.0180	0.0118
3	1	3	4	2	0	2	3	15435.8409	-0.0041
3	1	3	3	2	0	2	2	15435.8409	-0.0359
7	0	7	8	6	0	6	7	18455.4825	0.0421
7	2	6	6	6	2	5	5	18578.2142	0.0400
7	2	6	8	6	2	5	7	18578.2142	0.0337
7	2	5	6	6	2	4	5	18720.9862	0.0388
7	2	5	8	6	2	4	7	18720.9862	0.0315
5	1	5	4	4	0	4	3	20024.0320	0.0469
5	1	5	6	4	0	4	5	20024.0320	0.0106
8	1	8	8	7	1	7	7	20543.6609	0.0009
8	1	8	7	7	1	7	6	20543.6609	-0.0041
8	1	8	9	7	1	7	8	20543.6609	-0.0229
8	0	8	8	7	0	7	7	21042.9530	0.0510
8	0	8	7	7	0	7	6	21042.9530	0.0467
8	0	8	9	7	0	7	8	21042.9530	0.0294
8	2	7	8	7	2	6	7	21223.4972	0.0378
8	2	7	7	7	2	6	6	21223.4972	-0.0123

8	2	7	9	7	2	6	8	21223.4972	-0.0201
8	2	6	8	7	2	5	7	21435.5505	0.0142
8	2	6	7	7	2	5	6	21435.5505	-0.0202
8	2	6	9	7	2	5	8	21435.5505	-0.0290
8	1	7	8	7	1	6	7	21862.8470	-0.0193
8	1	7	9	7	1	6	8	21862.8470	-0.0414
6	1	6	5	5	0	5	4	22215.3441	0.0144
6	1	6	7	5	0	5	6	22215.3441	-0.0036
9	1	9	9	8	1	8	8	23097.2097	-0.0104
9	1	9	8	8	1	8	7	23097.2097	-0.0143
9	1	9	10	8	1	8	9	23097.2097	-0.0294
9	2	8	9	8	2	7	8	23865.4070	0.0483
9	2	8	8	8	2	7	7	23865.4070	0.0133
9	2	8	10	8	2	7	9	23865.4070	0.0056
9	2	7	9	8	2	6	8	24164.1491	0.0281
9	2	7	8	8	2	6	7	24164.1491	0.0100
9	2	7	10	8	2	6	9	24164.1491	0.0014
7	1	7	6	6	0	6	5	24349.7040	-0.0018
7	1	7	8	6	0	6	7	24349.7040	-0.0111
9	1	8	9	8	1	7	8	24576.8305	-0.0111
9	1	8	8	8	1	7	7	24576.8305	-0.0196
9	1	8	10	8	1	7	9	24576.8305	-0.0293
10	1	10	10	9	1	9	9	25646.3208	-0.0279
10	1	10	9	9	1	9	8	25646.3208	-0.0314
10	1	10	11	9	1	9	10	25646.3208	-0.0438

1.2.23 13C6 MCA_2 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S23: Measured frequencies and residuals (in MHz) for the rotational transitions of 13C6 MCA_2 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	F	J'	K_a'	K_c'	F'	Observed Freq. (MHz)	Residuals (MHz)
2	0	2	2	1	0	1	1	5266.2916	-0.0201
2	0	2	3	1	0	1	2	5266.3621	-0.0143
3	1	3	3	2	1	2	2	7660.8976	-0.0121
3	1	3	2	2	1	2	1	7661.1298	-0.0001
3	1	3	4	2	1	2	3	7661.1795	0.0072
3	0	3	2	2	0	2	1	7893.3897	0.0065
3	0	3	3	2	0	2	2	7893.5273	0.0089
3	0	3	4	2	0	2	3	7893.5273	-0.0309
4	0	4	3	3	0	3	2	10513.5592	0.0041
4	0	4	5	3	0	3	4	10513.6662	0.0297
1	1	1	2	0	0	0	1	10659.6190	0.0005
1	1	1	1	0	0	0	1	10659.8787	0.0156
5	1	5	4	4	1	4	3	12760.6980	-0.0205
5	1	5	5	4	1	4	4	12760.6980	0.0055
2	1	2	1	1	0	1	0	13132.7813	0.0052
2	1	2	2	1	0	1	2	13133.0400	-0.0016
2	1	2	3	1	0	1	2	13133.7042	0.0095
2	1	2	2	1	0	1	1	13133.8681	-0.0277
3	1	3	2	2	0	2	1	15528.2750	-0.0255
3	1	3	3	2	0	2	2	15528.5104	0.0165
3	1	3	4	2	0	2	3	15528.5104	0.0198
6	0	6	7	5	0	5	6	15723.3247	-0.0170
6	0	6	5	5	0	5	4	15723.3247	0.0144
6	0	6	6	5	0	5	5	15723.3247	0.0062
7	1	6	8	6	1	5	7	18968.7270	-0.0111
7	1	6	6	6	1	5	5	18968.7270	0.0026
7	1	6	7	6	1	5	6	18968.7270	0.0168
5	1	5	4	4	0	4	3	20094.1725	0.0498
5	1	5	6	4	0	4	5	20094.1725	0.0203
8	1	8	9	7	1	7	8	20388.4703	-0.0141
8	1	8	8	7	1	7	7	20388.4703	0.0094
8	1	8	7	7	1	7	6	20388.4703	0.0045
8	0	8	7	7	0	7	6	20879.0759	0.0360
8	0	8	8	7	0	7	7	20879.0759	0.0419
8	0	8	9	7	0	7	8	20879.0759	0.0194
6	1	6	5	5	0	5	4	22276.4979	-0.0094
6	1	6	7	5	0	5	6	22276.4979	-0.0224
9	1	9	9	8	1	8	8	22923.6682	-0.0257
9	1	9	8	8	1	8	7	22923.6682	-0.0297
9	1	9	10	8	1	8	9	22923.6682	-0.0446

9	0	9	8	8	0	8	7	23433.0007	0.0314
9	0	9	9	8	0	8	8	23433.0007	0.0412
9	0	9	10	8	0	8	9	23433.0007	0.0186
9	1	8	10	8	1	7	9	24356.2684	-0.0320
9	1	8	9	8	1	7	8	24356.2684	-0.0141
9	1	8	8	8	1	7	7	24356.2684	-0.0231

1.2.24 15N7 MCA_2 A state line list in the frequency range of 2-26 GHz using SPFIT/SPCAT.

Table S24: Measured frequencies and residuals (in MHz) for the rotational transitions of 15N7 MCA_2 A state in the low frequency region (2-26 GHz) fit using SPFIT/SPCAT suite of programs from Pickett.

J	K_a	K_c	J'	K_a'	K_c'	Observed Freq. (MHz)	Residuals (MHz)
2	0	2	1	0	1	5195.4872	0.0045
2	1	1	1	1	0	5353.9124	0.0048
3	1	3	2	1	2	7560.9432	-0.0035
3	0	3	2	0	2	7787.5788	-0.0052
4	0	4	3	0	3	10372.9147	-0.0210
1	1	1	0	0	0	10636.6238	0.0171
4	1	3	3	1	2	10703.2198	0.0062
5	1	5	4	1	4	12594.2386	0.0204
5	0	5	4	0	4	12949.3384	-0.0086
2	1	2	1	0	1	13079.3016	-0.0040
3	1	3	2	0	2	15444.7648	-0.0047
7	0	7	6	0	6	18067.2194	0.0156
7	2	6	6	2	5	18174.4354	0.0435
7	2	5	6	2	4	18299.0759	0.0216
7	1	6	6	1	5	18707.5529	-0.0364
5	1	5	4	0	4	19957.1302	-0.0031
8	1	8	7	1	7	20123.4762	0.0148
8	1	7	7	1	6	21367.6146	-0.0235
6	1	6	5	0	5	22114.9282	0.0035
9	1	9	8	1	8	22626.1975	-0.0021
9	1	8	8	1	7	24022.2732	-0.0030
7	1	7	6	0	6	24217.1756	-0.0235