

Supplementary material to the manuscript “Clusters of atmospheric relevance: H₂O/HCl/HNO₃. Prediction of IR & MW spectra”, by P. C. Gómez et al.

Supplement to Section 3.1

Assignment of individual spectra

The assignment of the spectra shown in Figure 3 is discussed in more detail in the following paragraphs. Below the spectrum of N1AC-3 is the spectrum of W2A, a species where water accepts protons from its two neighbours. The excess of positive charge in the O atom of water implies a weaker Hydrogen Bond (HB) with HNO₃ than in the N1AC series, resulting in a higher frequency and a loss of intensity (notice absorbance scale) of the O-H (HNO₃) stretch. On the other hand, the link between HCl and H₂O is stronger than that between HCl and HNO₃ in the former family, resulting in a slight redshift of the now weaker H-Cl bond stretch.

The same effects are enhanced in the spectrum below. This species, N1AW-4, has quite a different structure, with a larger HCl→H₂O proton transfer, yielding a lower frequency H-Cl vibration, which becomes the most intense band in the spectrum. There is a small HNO₃→HCl proton transfer, and the H-O (HNO₃) vibration appears weaker in intensity and higher in wavenumber than in previous cases, becoming closer to the wavenumber value in the free monomer. In the mid-frequency region, the HOH bending, at 1627 cm⁻¹, becomes very weak, and the NOH bend is red-shifted and overlaps the NO₂ symmetric stretch, giving one single stronger band.

When the water molecule is not near HCl, as in N1AW-2 represented next in the right-hand panels of Figure 3, the spectrum changes drastically. The HCl unit of the cluster is weakly bound to HNO₃ by a very limited proton transfer from the latter. This causes the O-H (HNO₃) to appear at higher wavenumber than in the preceding molecules, and although this vibration is the strongest of the spectrum, its absolute absorbance value is lower than in other spectra. The HCl stretch is here very weak, indicating that this vibration induces only a small global dipole variation for the cluster. Also the HOH bend is very weak, but in this case the next two vibrations in decreasing frequency are not overlapping as they did for N1AW-4.

Some of these effects are even more marked in the spectrum of N2A-1W3C, shown next in representation of the weakest bound species of this study. The O-H (HNO₃) stretch is weaker than the NO₂ asymmetric stretch, which involves also the motion of the attached H atom and creates a large induced dipole moment. There is a HCl→HNO₃ proton transfer, and thus the H-Cl stretch recovers its wavenumber and intensity, as in the N1AC series at the top of the Figure.

Finally, Figure 3 shows at the bottom the spectrum of a peculiar structure found in this series, labelled N1AC-oop-ring, a name that conveys the idea of a non-planar, ring-like configuration. This is the only clearly non-planar, stable structure found for this whole set of clusters. The HCl acts as proton donor to HNO₃ and proton acceptor from H₂O, situated in a parallel plane to the nitric acid. Interestingly, the spectrum of this cluster is fairly close to that of N2A-1W3C shown above, except for the far-infrared region, which reveals the powerful utility of this spectral zone to convey information on the inter-molecular structure of clusters.

A last point to raise corresponds to the NO₂ asymmetric stretching ($\sim 1735\text{ cm}^{-1}$) and water bending ($\sim 1630\text{ cm}^{-1}$) modes, which appear at almost unchanged frequency in the whole series, and with only minor intensity fluctuations, close also the corresponding values for the free monomers. These vibrations are therefore quite local, and are not perturbed by varying the bonds formed in the diverse structures created in the clusters.

Table 2b. Full list of predicted wavenumbers (in cm^{-1}) and intensities (km mole^{-1}) for the whole set of clusters studied in this work.

n1ac-5		n1ac-1		n1ac-3		n1ac-2		n1aw-5		n1ac-4		w2a		n1aw-4		n1aw-1p		n1aw-2		n1aw-2p		n1ac-oop-ring		n1aw-1	
Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.	Freq.	Intens.
17	1	22	5	24	2	20	1	23	1	12	5	18	2	22	0.1	19	3	13	0	12	15	39	1	14	
71	2	25	1	27	0	25	1	62	2	24	0	30	1	48	8	32	1	21	3	19	2	53	6	21	
75	3	71	2	78	2	80	6	77	1	63	3	74	2	53	4	57	0.5	53	77	56	0.1	66	2	36	
106	9	78	2	83	4	81	11	120	1	81	9	102	15	91	1	71	7	58	33	65	11	73	3	44	
141	3	104	20	100	25	100	7	133	20	99	10	148	17	110	4	99	1	72	11	72	82	93	9	68	
175	80	152	49	157	49	166	55	202	12	162	45	189	21	177	13	121	10	82	3	82	2	102	10	74	
231	25	230	22	231	24	234	16	225	90	234	21	238	20	192	80	131	106	119	8	117	5	154	38	93	
316	16	307	176	311	195	315	184	311	52	291	36	320	50	279	59	187	19	182	21	181	26	216	90	103	
355	81	364	29	350	22	352	25	439	162	312	185	411	30	396	151	268	82	212	104	206	73	281	151	230	
377	120	375	29	356	10	356	23	616	2	316	26	500	211	576	7	287	77	268	58	271	64	338	44	269	
527	33	410	39	414	59	415	61	660	24	411	46	540	78	605	37	410	89	364	87	361	90	442	20	384	
655	4	656	4	652	1	653	1	686	3	646	2	642	8	617	117	621	8	606	84	607	84	467	147	602	
698	5	696	2	696	1	698	2	691	111	683	7	683	4	662	25	628	79	617	1	617	1	601	5	614	
795	25	798	18	798	17	799	16	794	4	793	18	789	70	753	91	681	3	679	5	681	3	673	6	675	
878	86	879	99	879	99	879	101	856	41	873	95	811	65	789	8	793	8	792	8	793	8	784	14	792	
966	132	965	145	962	129	965	152	947	151	930	195	939	155	904	208	940	158	935	160	937	171	931	165	930	
1333	281	1326	344	1343	264	1345	351	1336	190	1332	278	1325	204	1332	379	1328	201	1345	231	1342	225	1339	316	1336	
1462	321	1476	236	1471	257	1471	263	1379	258	1477	186	1454	207	1339	163	1387	208	1378	164	1378	189	1358	97	1368	
1635	96	1620	154	1618	178	1618	166	1625	41	1619	152	1620	135	1627	54	1645	14	1642	47	1641	52	1641	52	1643	
1723	342	1733	289	1730	359	1727	252	1724	392	1744	282	1741	345	1742	376	1729	446	1727	449	1725	430	1731	373	1733	
2795	365	2800	516	2814	491	2810	509	2272	1442	2850	343	2769	555	2455	1015	2891	68	2890	69	2896	64	2796	357	2916	
3146	1297	3167	1225	3169	1303	3170	1276	3422	841	3162	1235	3357	807	3554	452	3502	604	3539	585	3538	592	3713	110	3568	
3700	250	3785	21	3784	21	3783	21	3737	187	3784	22	3728	103	3760	69	3757	158	3780	114	3782	103	3773	59	3774	
3864	146	3887	120	3886	114	3886	118	3863	179	3886	112	3853	136	3872	148	3875	132	3889	150	3890	112	3882	100	3887	

Table 3b. Predicted strong microwave transitions at 10 K for the clusters of Figure 4, using Watson's A-reduction. Intensity cut at 0.1×10^{-4} .

N1AC-5: a-type transitions ($J''=0-25$)

J'	Ka'	Kc'	<--	J''	Ka''	Kc''	Frequency (MHz)	logarithm of intensity
5	1	4		4	1	3	10063.288	0.158E-03
6	1	6		5	1	5	10611.710	0.206E-03
6	0	6		5	0	5	10939.013	0.227E-03
13	2	11		13	2	12	11223.954	0.113E-04
17	3	14		17	3	15	11368.617	0.105E-04
6	2	5		5	2	4	11374.643	0.206E-03
6	5	2		5	5	1	11490.562	0.555E-04
6	5	1		5	5	0	11490.571	0.555E-04
6	4	3		5	4	2	11505.112	0.113E-03
6	4	2		5	4	1	11506.027	0.113E-03
6	3	4		5	3	3	11521.483	0.168E-03
6	3	3		5	3	2	11560.658	0.169E-03
6	2	4		5	2	3	11883.733	0.224E-03
6	1	5		5	1	4	12019.121	0.259E-03
7	1	7		6	1	6	12336.580	0.310E-03
7	0	7		6	0	6	12609.580	0.332E-03
7	2	6		6	2	5	13229.257	0.317E-03
14	2	12		14	2	13	13377.598	0.132E-04
7	6	2		6	6	1	13403.719	0.628E-04
7	6	1		6	6	0	13403.720	0.628E-04
7	5	3		6	5	2	13416.159	0.133E-03
7	5	2		6	5	1	13416.204	0.133E-03
7	4	4		6	4	3	13438.585	0.206E-03
7	4	3		6	4	2	13441.617	0.206E-03
7	3	5		6	3	4	13453.973	0.273E-03
7	3	4		6	3	3	13540.338	0.277E-03
18	3	15		18	3	16	13702.492	0.122E-04
7	1	6		6	1	5	13937.863	0.385E-03
7	2	5		6	2	4	13973.832	0.351E-03
8	1	8		7	1	7	14048.315	0.434E-03
8	0	8		7	0	7	14259.092	0.455E-03
8	2	7		7	2	6	15065.794	0.448E-03
8	7	2		7	7	1	15317.058	0.656E-04
8	7	1		7	7	0	15317.058	0.656E-04
8	6	3		7	6	2	15328.043	0.144E-03
8	6	2		7	6	1	15328.045	0.144E-03
8	5	4		7	5	3	15346.593	0.232E-03
8	5	3		7	5	2	15346.773	0.232E-03
8	4	5		7	4	4	15378.495	0.320E-03
8	3	6		7	3	5	15385.065	0.401E-03
8	4	4		7	4	3	15386.754	0.321E-03
8	3	5		7	3	4	15552.286	0.410E-03
15	2	13		15	2	14	15578.525	0.146E-04
9	1	9		8	1	8	15748.629	0.573E-03
8	1	7		7	1	6	15809.706	0.530E-03
9	0	9		8	0	8	15901.671	0.592E-03
8	2	6		7	2	5	16063.796	0.504E-03
19	3	16		19	3	17	16130.116	0.135E-04
9	2	8		8	2	7	16882.693	0.595E-03
9	8	2		8	8	1	17230.503	0.641E-04
9	8	1		8	8	0	17230.503	0.641E-04
9	7	3		8	7	2	17240.526	0.146E-03
9	7	2		8	7	1	17240.526	0.146E-03
9	6	4		8	6	3	17256.183	0.242E-03
9	6	3		8	6	2	17256.192	0.242E-03
9	5	5		8	5	4	17282.520	0.347E-03
9	5	4		8	5	3	17283.103	0.347E-03
9	3	7		8	3	6	17311.000	0.547E-03
9	4	6		8	4	5	17324.727	0.453E-03
9	4	5		8	4	4	17344.284	0.454E-03
10	1	10		9	1	9	17439.571	0.722E-03
10	0	10		9	0	9	17545.596	0.739E-03
9	3	6		8	3	5	17602.911	0.564E-03
9	1	8		8	1	7	17626.027	0.686E-03
16	2	14		16	2	15	17775.080	0.154E-04

9	2	7	8	2	6	18134.983	0.675E-03
20	3	17	20	3	18	18593.620	0.142E-04
10	2	9	9	2	8	18679.055	0.750E-03
11	1	11	10	1	10	19123.215	0.876E-03
10	9	2	9	9	1	19144.013	0.589E-04
10	9	1	9	9	0	19144.013	0.589E-04
10	8	3	9	8	2	19153.361	0.138E-03
10	8	2	9	8	1	19153.361	0.138E-03
10	7	4	9	7	3	19167.123	0.237E-03
10	7	3	9	7	2	19167.123	0.237E-03
10	6	5	9	6	4	19188.630	0.351E-03
10	6	4	9	6	3	19188.664	0.351E-03
11	0	11	10	0	10	19194.115	0.891E-03
10	5	6	9	5	5	19224.534	0.474E-03
10	5	5	9	5	4	19226.152	0.474E-03
10	3	8	9	3	7	19227.744	0.703E-03
10	4	7	9	4	6	19276.502	0.597E-03
10	4	6	9	4	5	19318.063	0.599E-03
10	1	9	9	1	8	19382.577	0.845E-03
10	3	7	9	3	6	19694.110	0.734E-03
17	2	15	17	2	16	19925.355	0.157E-04
10	2	8	9	2	7	20173.561	0.855E-03
11	2	10	10	2	9	20454.763	0.908E-03
12	1	12	11	1	11	20801.433	0.103E-02
12	0	12	11	0	11	20847.591	0.104E-02
21	3	18	21	3	19	21037.096	0.142E-04
11	10	2	10	10	1	21057.568	0.512E-04
11	10	1	10	10	0	21057.568	0.512E-04
11	9	3	10	9	2	21066.416	0.124E-03
11	9	2	10	9	1	21066.416	0.124E-03
11	8	4	10	8	3	21078.867	0.219E-03
11	8	3	10	8	2	21078.867	0.219E-03
11	1	10	10	1	9	21082.804	0.100E-02
11	7	5	10	7	4	21097.206	0.334E-03
11	7	4	10	7	3	21097.208	0.334E-03
11	6	6	10	6	5	21125.881	0.466E-03
11	6	5	10	6	4	21125.989	0.466E-03
11	3	9	10	3	8	21131.350	0.862E-03
11	5	7	10	5	6	21173.106	0.607E-03
11	5	6	10	5	5	21177.108	0.607E-03
11	4	8	10	4	7	21232.250	0.747E-03
11	4	7	10	4	6	21313.159	0.752E-03
11	3	8	10	3	7	21819.847	0.913E-03
18	2	16	18	2	17	22003.191	0.154E-04
11	2	9	10	2	8	22169.496	0.103E-02
12	2	11	11	2	10	22210.527	0.106E-02
13	1	13	12	1	12	22475.780	0.117E-02
13	0	13	12	0	12	22505.216	0.119E-02
12	1	11	11	1	10	22738.728	0.114E-02
12	11	2	11	11	1	22971.154	0.422E-04
12	11	1	11	11	0	22971.154	0.422E-04
12	10	3	11	10	2	22979.617	0.105E-03
12	10	2	11	10	1	22979.617	0.105E-03
12	9	4	11	9	3	22991.110	0.192E-03
12	9	3	11	9	2	22991.110	0.192E-03
12	8	5	11	8	4	23007.290	0.302E-03
12	8	4	11	8	3	23007.290	0.302E-03
12	3	10	11	3	9	23018.270	0.102E-02
12	7	6	11	7	5	23031.141	0.434E-03
12	7	5	11	7	4	23031.147	0.434E-03
12	6	7	11	6	6	23068.431	0.582E-03
12	6	6	11	6	5	23068.734	0.582E-03
12	5	8	11	5	7	23128.509	0.740E-03
12	5	7	11	5	6	23137.527	0.740E-03
12	4	9	11	4	8	23189.565	0.895E-03
12	4	8	11	4	7	23335.760	0.905E-03
22	3	19	22	3	20	23414.291	0.138E-04
13	2	12	12	2	11	23947.837	0.120E-02
12	3	9	11	3	8	23965.139	0.109E-02
19	2	17	19	2	18	23999.204	0.147E-04
12	2	10	11	2	9	24114.473	0.120E-02
14	1	14	13	1	13	24147.463	0.131E-02
14	0	14	13	0	13	24165.931	0.132E-02
13	1	12	12	1	11	24367.596	0.127E-02
13	12	2	12	12	1	24884.762	0.332E-04
13	12	1	12	12	0	24884.762	0.332E-04
13	3	11	12	3	10	24885.574	0.116E-02

13	11	3	12	11	2	24892.920	0.852E-04
13	11	2	12	11	1	24892.920	0.852E-04
13	10	4	12	10	3	24903.686	0.160E-03
13	10	3	12	10	2	24903.686	0.160E-03
13	9	5	12	9	4	24918.309	0.259E-03
13	9	4	12	9	3	24918.309	0.259E-03
13	8	6	12	8	5	24938.906	0.383E-03
13	8	5	12	8	4	24938.907	0.383E-03
13	7	7	12	7	6	24969.300	0.530E-03
13	7	6	12	7	5	24969.319	0.530E-03
13	6	8	12	6	7	25016.766	0.694E-03
13	6	7	12	6	6	25017.538	0.694E-03
13	5	9	12	5	8	25090.697	0.867E-03
13	5	8	12	5	7	25109.508	0.868E-03
13	4	10	12	4	9	25145.273	0.103E-02
13	4	9	12	4	8	25392.470	0.105E-02
14	2	13	13	2	12	25668.791	0.132E-02
23	3	20	23	3	21	25694.974	0.129E-04
15	1	15	14	1	14	25817.371	0.142E-02
15	0	15	14	0	14	25828.805	0.143E-02
20	2	18	20	2	19	25917.071	0.137E-04
14	1	13	13	1	12	25986.056	0.138E-02
13	2	11	12	2	10	26000.856	0.135E-02
13	3	10	12	3	9	26109.214	0.126E-02
14	3	12	13	3	11	26731.107	0.128E-02
14	13	2	13	13	1	26798.386	0.249E-04
14	13	1	13	13	0	26798.386	0.249E-04
14	12	3	13	12	2	26806.298	0.657E-04
14	12	2	13	12	1	26806.298	0.657E-04
14	11	4	13	11	3	26816.491	0.127E-03
14	11	3	13	11	2	26816.491	0.127E-03
14	10	5	13	10	4	26829.945	0.211E-03
14	10	4	13	10	3	26829.945	0.211E-03
14	9	6	13	9	5	26848.227	0.322E-03
14	9	5	13	9	4	26848.227	0.322E-03
14	8	7	13	8	6	26873.996	0.458E-03
14	8	6	13	8	5	26873.997	0.458E-03
14	7	8	13	7	7	26912.065	0.618E-03
14	7	7	13	7	6	26912.120	0.618E-03
14	6	9	13	6	8	26971.338	0.795E-03
14	6	8	13	6	7	26973.151	0.795E-03
14	5	10	13	5	9	27059.188	0.981E-03
14	4	11	13	4	10	27095.612	0.116E-02
14	5	9	13	5	8	27095.920	0.983E-03
15	2	14	14	2	13	27375.871	0.142E-02
16	1	16	15	1	15	27486.128	0.151E-02
14	4	10	13	4	9	27488.599	0.119E-02
16	0	16	15	0	15	27493.130	0.152E-02
15	1	14	14	1	13	27605.817	0.147E-02
21	2	19	21	2	20	27767.819	0.124E-04
14	2	12	13	2	11	27822.435	0.146E-02
24	3	21	24	3	22	27866.988	0.117E-04
14	3	11	13	3	10	28231.114	0.140E-02
15	3	13	14	3	12	28553.595	0.138E-02
15	14	2	14	14	1	28712.024	0.179E-04
15	14	1	14	14	0	28712.024	0.179E-04
15	13	3	14	13	2	28719.730	0.485E-04
15	13	2	14	13	1	28719.730	0.485E-04
15	12	4	14	12	3	28729.464	0.961E-04
15	12	3	14	12	2	28729.464	0.961E-04
15	11	5	14	11	4	28742.007	0.165E-03
15	11	4	14	11	3	28742.007	0.165E-03
15	10	6	14	10	5	28758.567	0.258E-03
15	10	5	14	10	4	28758.567	0.258E-03
15	9	7	14	9	6	28781.083	0.378E-03
15	9	6	14	9	5	28781.083	0.378E-03
15	8	8	14	8	7	28812.848	0.525E-03
15	8	7	14	8	6	28812.851	0.525E-03
15	7	9	14	7	8	28859.827	0.695E-03
15	7	8	14	7	7	28859.970	0.695E-03
15	6	10	14	6	9	28932.533	0.882E-03
15	6	9	14	6	8	28936.502	0.882E-03
15	5	11	14	5	10	29032.924	0.108E-02
15	4	12	14	4	11	29036.501	0.126E-02
16	2	15	15	2	14	29071.671	0.150E-02
15	5	10	14	5	9	29100.614	0.108E-02
17	1	17	16	1	16	29154.159	0.158E-02

17	0	17	16	0	16	29158.408	0.158E-02
16	1	15	15	1	14	29232.777	0.154E-02
22	2	20	22	2	21	29564.859	0.111E-04
15	2	13	14	2	12	29576.798	0.155E-02
15	4	11	14	4	10	29625.341	0.130E-02
25	3	22	25	3	23	29933.388	0.104E-04

N1AC-5: b-type transitions ($J''=0-28$)

J'	Ka'	Kc'	\leftarrow	J''	Ka''	Kc''	Frequency (MHz)	logarithm of intensity
13	3	10		13	2	11	10061.093	0.120E-03
11	3	8		11	2	9	10102.069	0.129E-03
16	4	12		15	5	11	10114.279	0.232E-04
19	5	14		18	6	13	10136.519	0.147E-04
15	2	13		16	1	16	10171.344	0.491E-04
13	3	10		12	4	9	10186.102	0.326E-04
21	3	18		22	2	21	10244.072	0.214E-04
10	3	7		10	2	8	10451.718	0.139E-03
14	3	11		14	2	12	10469.771	0.123E-03
5	1	5		4	0	4	10494.611	0.138E-03
6	2	5		6	1	6	10502.717	0.129E-03
9	1	8		9	0	9	10544.072	0.325E-03
25	7	19		24	8	16	10572.484	0.437E-05
12	2	10		12	1	11	10613.999	0.150E-03
20	5	16		19	6	13	10828.711	0.154E-04
9	3	6		9	2	7	10931.170	0.150E-03
11	7	5		12	6	6	10934.163	0.106E-04
11	7	4		12	6	7	10934.621	0.106E-04
18	4	15		17	5	12	10936.091	0.244E-04
8	1	7		7	2	6	11019.632	0.535E-04
15	3	12		15	2	13	11206.775	0.130E-03
7	2	6		7	1	7	11395.393	0.166E-03
8	3	5		8	2	6	11463.242	0.158E-03
2	2	1		1	1	0	11570.486	0.894E-04
7	0	7		6	1	6	11672.798	0.154E-03
2	2	0		1	1	1	11828.167	0.934E-04
6	1	6		5	0	5	11875.795	0.196E-03
7	3	4		7	2	5	11974.752	0.159E-03
13	2	11		13	1	12	12247.259	0.192E-03
16	3	13		16	2	14	12283.439	0.144E-03
16	2	14		17	1	17	12285.411	0.667E-04
19	4	16		18	5	13	12287.707	0.283E-04
13	8	6		14	7	7	12315.997	0.106E-04
13	8	5		14	7	8	12316.081	0.106E-04
25	4	22		24	5	19	12351.983	0.126E-04
10	1	9		10	0	10	12381.053	0.454E-03
6	3	3		6	2	4	12408.247	0.152E-03
8	2	7		8	1	8	12412.872	0.210E-03
22	3	19		23	2	22	12564.251	0.278E-04
5	3	2		5	2	3	12731.322	0.134E-03
21	5	17		20	6	14	12741.711	0.192E-04
11	2	9		10	3	8	12788.673	0.653E-04
20	5	15		19	6	14	12876.985	0.217E-04
10	7	4		11	6	5	12905.691	0.119E-04
10	7	3		11	6	6	12905.844	0.119E-04
23	6	17		22	7	16	12930.001	0.117E-04
4	3	1		4	2	2	12939.877	0.104E-03
3	3	0		3	2	1	13052.841	0.608E-04
17	4	13		16	5	12	13092.154	0.370E-04
3	3	1		3	2	2	13134.523	0.616E-04
18	4	14		18	3	15	13161.350	0.122E-03
4	3	2		4	2	3	13178.561	0.108E-03
17	4	13		17	3	14	13200.647	0.138E-03
3	2	2		2	1	1	13237.556	0.127E-03
5	3	3		5	2	4	13265.255	0.145E-03
14	3	11		13	4	10	13271.943	0.553E-04
7	1	7		6	0	6	13273.363	0.265E-03
20	4	17		19	5	14	13348.334	0.302E-04
6	3	4		6	2	5	13412.095	0.178E-03
19	4	15		19	3	16	13459.426	0.113E-03
24	4	21		23	5	18	13495.228	0.179E-04
16	4	12		16	3	13	13527.847	0.160E-03
9	2	8		9	1	9	13546.937	0.260E-03

9	1	8	8	2	7	13579.865	0.890E-04
8	0	8	7	1	7	13595.309	0.228E-03
7	3	5	7	2	6	13636.811	0.208E-03
17	3	14	17	2	15	13689.741	0.162E-03
8	3	6	8	2	7	13956.083	0.235E-03
24	6	19	23	7	16	14020.165	0.119E-04
3	2	1	2	1	2	14043.251	0.143E-03
21	4	18	20	5	15	14051.390	0.298E-04
15	4	11	15	3	12	14076.051	0.189E-03
14	2	12	14	1	13	14083.638	0.240E-03
20	4	16	20	3	17	14126.219	0.108E-03
23	4	20	22	5	17	14158.274	0.230E-04
11	1	10	11	0	11	14269.742	0.600E-03
12	8	5	13	7	6	14289.211	0.124E-04
12	8	4	13	7	7	14289.239	0.124E-04
22	4	19	21	5	16	14336.390	0.273E-04
17	2	15	18	1	18	14372.615	0.839E-04
9	3	7	9	2	8	14384.390	0.262E-03
22	5	18	21	6	15	14528.081	0.220E-04
8	1	8	7	0	7	14712.097	0.343E-03
14	4	10	14	3	11	14764.511	0.223E-03
4	2	3	3	1	2	14781.910	0.172E-03
10	2	9	10	1	10	14786.421	0.316E-03
23	3	20	24	2	23	14805.609	0.331E-04
9	7	3	10	6	4	14864.557	0.115E-04
9	7	2	10	6	5	14864.602	0.115E-04
10	3	8	10	2	9	14933.079	0.289E-03
21	4	17	21	3	18	15173.610	0.107E-03
18	3	15	18	2	16	15390.498	0.183E-03
9	0	9	8	1	8	15448.666	0.313E-03
13	4	9	13	3	10	15507.026	0.259E-03
11	3	9	11	2	10	15609.666	0.316E-03
24	6	18	23	7	17	15623.528	0.147E-04
14	9	6	15	8	7	15671.848	0.115E-04
14	9	5	15	8	8	15671.853	0.115E-04
12	2	10	11	3	9	15771.796	0.102E-03
21	5	16	20	6	15	15834.862	0.294E-04
15	2	13	15	1	14	16054.619	0.291E-03
25	6	20	24	7	17	16072.206	0.134E-04
10	1	9	9	2	8	16079.749	0.132E-03
11	2	10	11	1	11	16117.968	0.375E-03
23	5	19	22	6	16	16136.165	0.237E-04
12	1	11	12	0	12	16160.879	0.753E-03
23	5	18	23	4	19	16201.003	0.792E-04
9	1	9	8	0	8	16201.634	0.431E-03
5	2	4	4	1	3	16206.447	0.222E-03
12	4	8	12	3	9	16223.771	0.294E-03
11	8	4	12	7	5	16251.240	0.130E-04
11	8	3	12	7	6	16251.249	0.130E-04
18	4	14	17	5	13	16282.035	0.535E-04
24	5	19	24	4	20	16377.182	0.671E-04
22	5	17	22	4	18	16393.050	0.966E-04
18	2	16	19	1	19	16400.460	0.991E-04
12	3	10	12	2	11	16417.409	0.343E-03
4	2	2	3	1	3	16471.463	0.215E-03
15	3	12	14	4	11	16490.132	0.833E-04
22	4	18	22	3	19	16590.606	0.109E-03
11	4	7	11	3	8	16853.150	0.322E-03
21	5	16	21	4	17	16896.164	0.121E-03
24	3	21	25	2	24	16949.822	0.367E-04
25	5	20	25	4	21	16957.915	0.589E-04
10	0	10	9	1	9	17245.633	0.405E-03
19	3	16	19	2	17	17326.709	0.204E-03
13	3	11	13	2	12	17355.146	0.370E-03
10	4	6	10	3	7	17359.837	0.339E-03
24	5	20	23	6	17	17505.533	0.240E-04
6	2	5	5	1	4	17517.802	0.274E-03
12	2	11	12	1	12	17527.063	0.436E-03
20	5	15	20	4	16	17634.076	0.153E-03
13	9	5	14	8	6	17636.472	0.127E-04
13	9	4	14	8	7	17636.474	0.127E-04
9	4	5	9	3	6	17735.884	0.342E-03
10	1	10	9	0	9	17739.534	0.524E-03
26	5	21	26	4	22	17957.547	0.536E-04
8	4	4	8	3	5	17994.511	0.329E-03
13	1	12	13	0	13	18023.259	0.904E-03
26	6	21	25	7	18	18034.168	0.141E-04

16	2	14	16	1	15	18090.068	0.340E-03
7	4	3	7	3	4	18160.042	0.300E-03
10	8	3	11	7	4	18203.521	0.119E-04
10	8	2	11	7	5	18203.523	0.119E-04
6	4	2	6	3	3	18258.763	0.255E-03
8	4	5	8	3	6	18294.694	0.340E-03
7	4	4	7	3	5	18301.265	0.305E-03
9	4	6	9	3	7	18308.421	0.365E-03
5	4	1	5	3	2	18313.394	0.193E-03
6	4	3	6	3	4	18316.653	0.257E-03
5	4	2	5	3	3	18333.024	0.193E-03
23	4	19	23	3	20	18340.125	0.112E-03
4	4	0	4	3	1	18341.083	0.110E-03
4	4	1	4	3	2	18346.048	0.110E-03
19	2	17	20	1	20	18354.944	0.111E-03
10	4	7	10	3	8	18357.179	0.380E-03
14	3	12	14	2	13	18417.462	0.397E-03
11	4	8	11	3	9	18458.078	0.387E-03
11	1	10	10	2	9	18483.497	0.181E-03
19	5	14	19	4	15	18516.774	0.193E-03
25	6	19	24	7	18	18518.937	0.176E-04
29	5	25	28	6	22	18519.567	0.103E-04
25	5	21	24	6	18	18569.108	0.229E-04
12	4	9	12	3	10	18629.372	0.390E-03
7	2	6	6	1	5	18727.938	0.325E-03
13	2	11	12	3	10	18754.382	0.145E-03
3	3	1	2	2	0	18842.449	0.367E-03
3	3	0	2	2	1	18859.747	0.368E-03
13	4	10	13	3	11	18889.071	0.389E-03
25	3	22	26	2	25	18995.452	0.386E-04
13	2	12	13	1	13	18999.119	0.495E-03
11	0	11	10	1	10	19000.176	0.501E-03
15	10	6	16	9	7	19020.645	0.110E-04
15	10	5	16	9	8	19020.645	0.110E-04
22	5	17	21	6	16	19028.574	0.375E-04
5	2	3	4	1	4	19166.239	0.313E-03
28	6	22	28	5	23	19207.557	0.350E-04
29	6	23	29	5	24	19250.989	0.276E-04
14	4	11	14	3	12	19253.576	0.385E-03
26	5	22	25	6	19	19257.778	0.206E-04
28	5	24	27	6	21	19270.407	0.139E-04
11	1	11	10	0	10	19317.154	0.621E-03
27	5	22	27	4	23	19365.868	0.500E-04
20	3	17	20	2	18	19423.378	0.225E-03
18	5	13	18	4	14	19450.536	0.241E-03
27	5	23	26	6	20	19507.864	0.174E-04
27	6	21	27	5	22	19557.980	0.458E-04
12	9	4	13	8	5	19592.161	0.128E-04
12	9	3	13	8	6	19592.161	0.128E-04
15	3	13	15	2	14	19595.186	0.422E-03
19	4	15	18	5	14	19662.319	0.715E-04
30	6	24	30	5	25	19730.824	0.224E-04
15	4	12	15	3	13	19736.482	0.379E-03
16	3	13	15	4	12	19798.522	0.115E-03
14	1	13	14	0	14	19843.384	0.104E-02
8	2	7	7	1	6	19855.868	0.373E-03
27	6	22	26	7	19	19862.253	0.142E-04
17	2	15	17	1	16	20130.481	0.384E-03
20	2	18	21	1	21	20236.496	0.120E-03
26	6	20	26	5	21	20236.748	0.612E-04
16	4	13	16	3	14	20347.649	0.373E-03
17	5	12	17	4	13	20350.621	0.294E-03
24	4	20	24	3	21	20359.896	0.115E-03
14	2	13	14	1	14	20520.447	0.552E-03
4	3	2	3	2	1	20715.929	0.451E-03
12	0	12	11	1	11	20724.552	0.595E-03
12	1	11	11	2	10	20767.463	0.230E-03
4	3	1	3	2	2	20803.317	0.455E-03
16	3	14	16	2	15	20876.201	0.443E-03
12	1	12	11	0	11	20924.472	0.717E-03
9	2	8	8	1	7	20928.855	0.416E-03
26	3	23	27	2	26	20951.948	0.389E-04
14	10	5	15	9	6	20979.177	0.117E-04
14	10	4	15	9	7	20979.177	0.117E-04
17	4	14	17	3	15	21092.589	0.365E-03
28	5	23	28	4	24	21145.365	0.473E-04
16	5	11	16	4	12	21152.967	0.349E-03

25	6	19	25	5	20	21158.289	0.824E-04
28	6	23	27	7	20	21503.293	0.137E-04
11	9	3	12	8	4	21539.957	0.112E-04
11	9	2	12	8	5	21539.957	0.112E-04
21	3	18	21	2	19	21601.821	0.240E-03
15	1	14	15	0	15	21620.396	0.116E-02
26	6	20	25	7	19	21648.985	0.202E-04
14	2	12	13	3	11	21691.243	0.190E-03
15	5	10	15	4	11	21821.096	0.402E-03
18	4	15	18	3	16	21972.189	0.357E-03
10	2	9	9	1	8	21981.884	0.455E-03
21	2	19	22	1	22	22053.935	0.125E-03
15	2	14	15	1	15	22078.947	0.602E-03
18	2	16	18	1	17	22135.003	0.418E-03
6	2	4	5	1	5	22177.309	0.442E-03
24	6	18	24	5	19	22224.053	0.111E-03
17	3	15	17	2	16	22246.479	0.460E-03
14	5	9	14	4	10	22345.823	0.448E-03
13	0	13	12	1	12	22428.335	0.685E-03
23	5	18	22	6	17	22457.751	0.454E-04
5	3	3	4	2	2	22525.594	0.546E-03
13	1	13	12	0	12	22552.661	0.809E-03
25	4	21	25	3	22	22569.530	0.116E-03
13	5	8	13	4	9	22738.502	0.484E-03
5	3	2	4	2	3	22789.127	0.559E-03
27	3	24	28	2	27	22833.700	0.380E-04
29	6	24	28	7	21	22895.184	0.125E-04
13	1	12	12	2	11	22924.532	0.278E-03
13	10	4	14	9	5	22930.315	0.114E-04
13	10	3	14	9	6	22930.315	0.114E-04
19	4	16	19	3	17	22982.797	0.347E-03
12	5	7	12	4	8	23021.463	0.508E-03
11	2	10	10	1	9	23054.069	0.488E-03
17	3	14	16	4	13	23149.917	0.147E-03
20	4	16	19	5	15	23195.483	0.897E-04
15	5	11	15	4	12	23212.090	0.456E-03
14	5	10	14	4	11	23215.666	0.485E-03
11	5	6	11	4	7	23219.696	0.517E-03
29	5	24	29	4	25	23231.770	0.450E-04
13	5	9	13	4	10	23252.091	0.507E-03
16	5	12	16	4	13	23258.410	0.425E-03
12	5	8	12	4	9	23306.666	0.521E-03
23	6	17	23	5	18	23333.954	0.147E-03
10	5	5	10	4	6	23355.747	0.511E-03
16	1	15	16	0	16	23360.043	0.126E-02
11	5	7	11	4	8	23367.722	0.524E-03
17	5	13	17	4	14	23373.005	0.392E-03
10	5	6	10	4	7	23426.865	0.514E-03
9	5	4	9	4	5	23447.658	0.485E-03
9	5	5	9	4	6	23478.834	0.487E-03
8	5	3	8	4	4	23508.839	0.441E-03
8	5	4	8	4	5	23521.040	0.441E-03
7	5	2	7	4	3	23548.821	0.374E-03
7	5	3	7	4	4	23552.942	0.374E-03
6	5	1	6	4	2	23574.233	0.282E-03
18	5	14	18	4	15	23574.323	0.359E-03
6	5	2	6	4	3	23575.369	0.282E-03
5	5	0	5	4	1	23589.690	0.161E-03
5	5	1	5	4	2	23589.918	0.161E-03
16	2	15	16	1	16	23664.490	0.643E-03
18	3	16	18	2	17	23691.198	0.471E-03
22	3	19	22	2	20	23792.594	0.250E-03
22	2	20	23	1	23	23819.222	0.127E-03
19	5	15	19	4	16	23879.567	0.328E-03
30	6	25	29	7	22	23968.897	0.110E-04
19	2	17	19	1	18	24082.948	0.441E-03
20	4	17	20	3	18	24116.642	0.336E-03
14	0	14	13	1	13	24118.486	0.768E-03
12	2	11	11	1	10	24181.793	0.518E-03
14	1	14	13	0	13	24194.908	0.892E-03
6	3	4	5	2	3	24232.946	0.643E-03
20	5	16	20	4	17	24303.458	0.298E-03
22	6	16	22	5	17	24399.700	0.190E-03
15	2	13	14	3	12	24536.934	0.235E-03
28	3	25	29	2	28	24655.799	0.360E-04
30	7	23	30	6	24	24667.811	0.311E-04
6	3	3	5	2	4	24845.773	0.677E-03

21	5	17	21	4	18	24857.212	0.270E-03
26	4	22	26	3	23	24882.556	0.115E-03
14	1	13	13	2	12	24962.751	0.321E-03
27	6	21	26	7	20	25034.590	0.224E-04
17	1	16	17	0	17	25070.170	0.134E-02
19	3	17	19	2	18	25195.797	0.476E-03
17	2	16	17	1	17	25269.002	0.674E-03
21	6	15	21	5	16	25356.115	0.240E-03
21	4	18	21	3	19	25362.582	0.323E-03
13	2	12	12	1	11	25390.901	0.544E-03
7	2	5	6	1	6	25539.432	0.610E-03
30	5	25	30	4	26	25540.409	0.424E-04
23	2	21	24	1	24	25544.142	0.125E-03
22	5	18	22	4	19	25547.806	0.245E-03
15	0	15	14	1	14	25799.828	0.839E-03
7	3	5	6	2	4	25803.186	0.735E-03
15	1	15	14	0	14	25846.349	0.963E-03
29	7	22	29	6	23	25907.343	0.441E-04
23	3	20	23	2	21	25944.990	0.252E-03
20	2	18	20	1	19	25969.755	0.452E-03
4	4	1	3	3	0	26009.136	0.880E-03
4	4	0	3	3	1	26009.877	0.880E-03
24	5	19	23	6	18	26101.116	0.525E-04
20	6	14	20	5	15	26166.891	0.296E-03
23	5	19	23	4	20	26377.590	0.221E-03
29	3	26	30	2	29	26431.752	0.334E-04
18	3	15	17	4	14	26493.690	0.178E-03
14	2	13	13	1	12	26692.097	0.565E-03
22	4	19	22	3	20	26707.074	0.308E-03
20	3	18	20	2	19	26746.830	0.474E-03
18	1	17	18	0	18	26758.250	0.138E-02
19	6	13	19	5	14	26823.081	0.354E-03
21	4	17	20	5	16	26833.327	0.107E-03
18	2	17	18	1	18	26886.327	0.694E-03
15	1	14	14	2	13	26899.777	0.357E-03
7	3	4	6	2	5	27011.467	0.808E-03
28	7	21	28	6	22	27180.807	0.618E-04
8	3	6	7	2	5	27214.419	0.815E-03
27	4	23	27	3	24	27219.948	0.112E-03
24	2	22	25	1	25	27238.760	0.121E-03
16	2	14	15	3	13	27251.565	0.274E-03
18	6	12	18	5	13	27335.790	0.413E-03
24	5	20	24	4	21	27344.259	0.199E-03
16	0	16	15	1	15	27475.587	0.898E-03
16	1	16	15	0	15	27503.672	0.102E-02
17	6	11	17	5	12	27726.837	0.470E-03
21	2	19	21	1	20	27800.680	0.452E-03
21	6	16	21	5	17	27885.765	0.293E-03
20	6	15	20	5	16	27894.629	0.338E-03
5	4	2	4	3	1	27918.740	0.100E-02
5	4	1	4	3	2	27923.961	0.100E-02
22	6	17	22	5	18	27944.421	0.252E-03
19	6	14	19	5	15	27952.573	0.386E-03
16	6	10	16	5	11	28020.894	0.523E-03
24	3	21	24	2	22	28030.304	0.247E-03
18	6	13	18	5	14	28042.573	0.435E-03
15	2	14	14	1	13	28081.912	0.583E-03
23	6	18	23	5	19	28089.320	0.216E-03
23	4	20	23	3	21	28135.270	0.291E-03
17	6	12	17	5	13	28149.921	0.485E-03
15	6	9	15	5	10	28240.656	0.570E-03
16	6	11	16	5	12	28262.771	0.533E-03
21	3	19	21	2	20	28332.544	0.465E-03
24	6	19	24	5	20	28338.202	0.184E-03
15	6	10	15	5	11	28372.335	0.575E-03
27	7	20	27	6	21	28397.565	0.847E-04
14	6	8	14	5	9	28404.768	0.607E-03
19	1	18	19	0	19	28430.420	0.140E-02
25	5	21	25	4	22	28441.178	0.179E-03
9	3	7	8	2	6	28461.623	0.878E-03
14	6	9	14	5	10	28472.726	0.610E-03
19	2	18	19	1	19	28511.958	0.701E-03
13	6	7	13	5	8	28527.537	0.633E-03
13	6	8	13	5	9	28560.576	0.634E-03
12	6	6	12	5	7	28619.508	0.643E-03
12	6	7	12	5	8	28634.507	0.644E-03
28	6	22	27	7	21	28677.865	0.240E-04

11	6	5	11	5	6	28688.301	0.635E-03
11	6	6	11	5	7	28694.585	0.636E-03
25	6	20	25	5	21	28706.599	0.156E-03
10	6	4	10	5	5	28739.420	0.606E-03
10	6	5	10	5	6	28741.810	0.607E-03
16	1	15	15	2	14	28756.683	0.386E-03
9	6	3	9	5	4	28776.908	0.553E-03
9	6	4	9	5	5	28777.714	0.553E-03
8	6	2	8	5	3	28803.819	0.471E-03
8	6	3	8	5	4	28804.051	0.471E-03
7	6	1	7	5	2	28822.547	0.357E-03
7	6	2	7	5	3	28822.601	0.357E-03
6	6	0	6	5	1	28835.032	0.203E-03
6	6	1	6	5	2	28835.040	0.203E-03
25	2	23	26	1	26	28911.015	0.115E-03
17	0	17	16	1	16	29147.867	0.941E-03
17	1	17	16	0	16	29164.701	0.106E-02
26	6	21	26	5	22	29206.764	0.132E-03
8	2	6	7	1	7	29266.648	0.818E-03
8	3	5	7	2	6	29334.496	0.951E-03
26	7	19	26	6	20	29492.465	0.113E-03
28	4	24	28	3	25	29520.975	0.105E-03
16	2	15	15	1	14	29547.766	0.594E-03
10	3	8	9	2	7	29554.384	0.921E-03
22	2	20	22	1	21	29585.200	0.442E-03
24	4	21	24	3	22	29632.099	0.272E-03
26	5	22	26	4	23	29658.037	0.160E-03
19	3	16	18	4	15	29777.215	0.205E-03
17	2	15	16	3	14	29807.825	0.306E-03
6	4	3	5	3	2	29818.277	0.113E-02
6	4	2	5	3	3	29839.281	0.113E-02
27	6	22	27	5	23	29846.854	0.112E-03
25	5	20	24	6	19	29919.123	0.582E-04
22	3	20	22	2	21	29943.162	0.449E-03

N1AC-3: a-type transitions (J''=0-30)

J' Ka' Kc' <--	J'' Ka'' Kc''	Frequency (MHz)	logarithm of intensity
4 1 4	3 1 3	5494.472	0.206E-03
4 0 4	3 0 3	5682.684	0.240E-03
4 2 3	3 2 2	5699.532	0.167E-03
4 3 2	3 3 1	5704.556	0.881E-04
4 3 1	3 3 0	5704.680	0.881E-04
4 2 2	3 2 1	5717.803	0.168E-03
4 1 3	3 1 2	5900.115	0.237E-03
18 2 16	18 2 17	6578.374	0.104E-04
5 1 5	4 1 4	6864.795	0.400E-03
5 0 5	4 0 4	7089.758	0.453E-03
5 2 4	4 2 3	7122.126	0.354E-03
5 4 2	4 4 1	7130.263	0.119E-03
5 4 1	4 4 0	7130.265	0.119E-03
5 3 3	4 3 2	7132.274	0.244E-03
5 3 2	4 3 1	7132.707	0.244E-03
5 2 3	4 2 2	7158.561	0.357E-03
5 1 4	4 1 3	7371.570	0.459E-03
19 2 17	19 2 18	7760.980	0.121E-04
12 1 11	12 1 12	7810.846	0.110E-04
6 1 6	5 1 5	8233.031	0.675E-03
6 0 6	5 0 5	8488.006	0.750E-03
6 2 5	5 2 4	8543.197	0.623E-03
6 5 2	5 5 1	8556.011	0.140E-03
6 5 1	5 5 0	8556.011	0.140E-03
6 4 3	5 4 2	8557.656	0.306E-03
6 4 2	5 4 1	8557.663	0.306E-03
6 3 4	5 3 3	8560.933	0.477E-03
6 3 3	5 3 2	8562.088	0.477E-03
6 2 4	5 2 3	8606.617	0.632E-03
6 1 5	5 1 4	8840.528	0.772E-03
20 2 18	20 2 19	9040.690	0.136E-04
13 1 12	13 1 13	9069.657	0.126E-04
7 1 7	6 1 6	9598.873	0.103E-02
7 0 7	6 0 6	9876.052	0.113E-02
7 2 6	6 2 5	9962.441	0.976E-03
7 6 2	6 6 1	9981.799	0.148E-03

7	6	1	6	6	0	9981.799	0.148E-03
7	5	3	6	5	2	9983.170	0.342E-03
7	5	2	6	5	1	9983.171	0.342E-03
7	4	4	6	4	3	9985.777	0.564E-03
7	4	3	6	4	2	9985.800	0.564E-03
7	3	5	6	3	4	9990.614	0.788E-03
7	3	4	6	3	3	9993.209	0.789E-03
7	2	5	6	2	4	10063.038	0.995E-03
7	1	6	6	1	5	10306.370	0.118E-02
14	1	13	14	1	14	10403.741	0.141E-04
21	2	19	21	2	20	10412.113	0.148E-04
8	1	8	7	1	7	10962.064	0.147E-02
8	0	8	7	0	7	11252.897	0.160E-02
8	2	7	7	2	6	11379.559	0.141E-02
8	7	2	7	7	1	11407.608	0.143E-03
8	7	1	7	7	0	11407.608	0.143E-03
8	6	3	7	6	2	11408.817	0.347E-03
8	6	2	7	6	1	11408.817	0.347E-03
8	5	4	7	5	3	11410.864	0.603E-03
8	5	3	7	5	2	11410.864	0.603E-03
8	4	5	7	4	4	11414.742	0.891E-03
8	4	4	7	4	3	11414.806	0.891E-03
8	3	6	7	3	5	11421.342	0.118E-02
8	3	5	7	3	4	11426.522	0.118E-02
8	2	6	7	2	5	11528.510	0.145E-02
8	1	7	7	1	6	11768.419	0.167E-02
15	1	14	15	1	15	11805.285	0.153E-04
22	2	20	22	2	21	11868.861	0.158E-04
9	1	9	8	1	8	12322.412	0.199E-02
9	0	9	8	0	8	12618.060	0.214E-02
9	2	8	8	2	7	12794.257	0.192E-02
9	8	2	8	8	1	12833.428	0.127E-03
9	8	1	8	8	0	12833.428	0.127E-03
9	7	3	8	7	2	12834.532	0.323E-03
9	7	2	8	7	1	12834.532	0.323E-03
9	6	4	8	6	3	12836.254	0.591E-03
9	6	3	8	6	2	12836.254	0.591E-03
9	5	5	8	5	4	12839.168	0.920E-03
9	5	4	8	5	3	12839.169	0.920E-03
9	4	6	8	4	5	12844.663	0.128E-02
9	4	5	8	4	4	12844.816	0.128E-02
9	3	7	8	3	6	12853.084	0.164E-02
9	3	6	8	3	5	12862.553	0.164E-02
9	2	7	8	2	6	13003.195	0.198E-02
9	1	8	8	1	7	13225.918	0.224E-02
16	1	15	16	1	16	13265.300	0.163E-04
23	2	21	23	2	22	13403.542	0.165E-04
10	1	10	9	1	9	13679.783	0.256E-02
10	0	10	9	0	9	13971.682	0.273E-02
10	2	9	9	2	8	14206.245	0.249E-02
10	9	1	9	9	0	14259.256	0.105E-03
10	9	2	9	9	1	14259.256	0.105E-03
10	8	2	9	8	1	14260.285	0.280E-03
10	8	3	9	8	2	14260.285	0.280E-03
10	7	4	9	7	3	14261.799	0.536E-03
10	7	3	9	7	2	14261.799	0.536E-03
10	6	5	9	6	4	14264.161	0.876E-03
10	6	4	9	6	3	14264.161	0.876E-03
10	5	6	9	5	5	14268.159	0.128E-02
10	5	5	9	5	4	14268.163	0.128E-02
10	4	7	9	4	6	14275.644	0.173E-02
10	4	6	9	4	5	14275.975	0.173E-02
10	3	8	9	3	7	14285.740	0.216E-02
10	3	7	9	3	6	14301.905	0.216E-02
10	2	8	9	2	7	14486.622	0.258E-02
10	1	9	9	1	8	14678.034	0.288E-02
17	1	16	17	1	17	14773.779	0.170E-04
24	2	22	24	2	23	15007.746	0.168E-04
11	1	11	10	1	10	15034.113	0.318E-02
11	0	11	10	0	10	15314.557	0.336E-02
11	2	10	10	2	9	15615.246	0.310E-02
11	10	2	10	10	1	15685.088	0.806E-04
11	10	1	10	10	0	15685.088	0.806E-04
11	9	3	10	9	2	15686.063	0.225E-03
11	9	2	10	9	1	15686.063	0.225E-03
11	8	4	10	8	3	15687.433	0.453E-03
11	8	3	10	8	2	15687.433	0.453E-03

11	7	5	10	7	4	15689.448	0.775E-03
11	7	4	10	7	3	15689.448	0.775E-03
11	6	6	10	6	5	15692.593	0.119E-02
11	6	5	10	6	4	15692.593	0.119E-02
11	5	7	10	5	6	15697.914	0.168E-02
11	5	6	10	5	5	15697.923	0.168E-02
11	4	8	10	4	7	15707.782	0.221E-02
11	4	7	10	4	6	15708.442	0.221E-02
11	3	9	10	3	8	15719.148	0.272E-02
11	3	8	10	3	7	15745.268	0.273E-02
11	2	9	10	2	8	15977.657	0.323E-02
11	1	10	10	1	9	16123.846	0.356E-02
18	1	17	18	1	18	16319.982	0.174E-04
12	1	12	11	1	11	16385.397	0.383E-02
12	0	12	11	0	11	16648.057	0.402E-02
25	2	23	25	2	24	16672.067	0.168E-04
12	2	11	11	2	10	17020.991	0.374E-02
12	11	2	11	11	1	17110.924	0.582E-04
12	11	1	11	11	0	17110.924	0.582E-04
12	10	3	11	10	2	17111.856	0.170E-03
12	10	2	11	10	1	17111.856	0.170E-03
12	9	3	11	9	2	17113.121	0.358E-03
12	9	4	11	9	3	17113.121	0.358E-03
12	8	4	11	8	3	17114.900	0.641E-03
12	8	5	11	8	4	17114.900	0.641E-03
12	7	5	11	7	4	17117.517	0.103E-02
12	7	6	11	7	5	17117.517	0.103E-02
12	6	7	11	6	6	17121.601	0.153E-02
12	6	6	11	6	5	17121.601	0.153E-02
12	5	8	11	5	7	17128.510	0.210E-02
12	5	7	11	5	6	17128.528	0.210E-02
12	4	9	11	4	8	17141.160	0.272E-02
12	4	8	11	4	7	17142.394	0.272E-02
12	3	10	11	3	9	17153.084	0.331E-02
12	3	9	11	3	8	17193.408	0.332E-02
12	2	10	11	2	9	17474.567	0.392E-02
12	1	11	11	1	10	17562.356	0.425E-02
13	1	13	12	1	12	17733.689	0.448E-02
19	1	18	19	1	19	17892.832	0.175E-04
13	0	13	12	0	12	17973.954	0.467E-02
26	2	24	26	2	25	18386.182	0.165E-04
13	2	12	12	2	11	18423.233	0.438E-02
13	12	1	12	12	0	18536.762	0.395E-04
13	12	2	12	12	1	18536.762	0.395E-04
13	11	3	12	11	2	18537.661	0.121E-03
13	11	2	12	11	1	18537.661	0.121E-03
13	10	4	12	10	3	18538.846	0.266E-03
13	10	3	12	10	2	18538.846	0.266E-03
13	9	5	12	9	4	18540.455	0.498E-03
13	9	4	12	9	3	18540.455	0.498E-03
13	8	6	12	8	5	18542.717	0.837E-03
13	8	5	12	8	4	18542.717	0.837E-03
13	7	6	12	7	5	18546.044	0.130E-02
13	7	7	12	7	6	18546.044	0.130E-02
13	6	8	12	6	7	18551.238	0.187E-02
13	6	7	12	6	6	18551.238	0.187E-02
13	5	9	12	5	8	18560.021	0.253E-02
13	5	8	12	5	7	18560.061	0.253E-02
13	4	10	12	4	9	18575.842	0.323E-02
13	4	9	12	4	8	18578.031	0.323E-02
13	3	11	12	3	10	18587.263	0.390E-02
13	3	10	12	3	9	18647.156	0.392E-02
13	2	11	12	2	10	18975.196	0.460E-02
13	1	12	12	1	11	18992.500	0.494E-02
14	1	14	13	1	13	19079.097	0.512E-02
14	0	14	13	0	13	19294.182	0.530E-02
20	1	19	20	1	20	19481.413	0.172E-04
14	2	13	13	2	12	19821.741	0.500E-02
14	13	2	13	13	1	19962.602	0.253E-04
14	13	1	13	13	0	19962.602	0.253E-04
14	12	3	13	12	2	19963.474	0.807E-04
14	12	2	13	12	1	19963.474	0.807E-04
14	11	4	13	11	3	19964.596	0.185E-03
14	11	3	13	11	2	19964.596	0.185E-03
14	10	5	13	10	4	19966.076	0.363E-03
14	10	4	13	10	3	19966.076	0.363E-03
14	9	6	13	9	5	19968.086	0.638E-03

14	9	5	13	9	4	19968.086	0.638E-03
14	8	7	13	8	6	19970.911	0.103E-02
14	8	6	13	8	5	19970.911	0.103E-02
14	7	8	13	7	7	19975.068	0.156E-02
14	7	7	13	7	6	19975.068	0.156E-02
14	6	9	13	6	8	19981.557	0.221E-02
14	6	8	13	6	7	19981.558	0.221E-02
14	5	10	13	5	9	19992.524	0.295E-02
14	5	9	13	5	8	19992.603	0.295E-02
14	4	11	13	4	10	20011.875	0.374E-02
14	4	10	13	4	9	20015.582	0.374E-02
14	3	12	13	3	11	20021.351	0.447E-02
14	3	11	13	3	10	20107.374	0.451E-02
27	2	25	27	2	26	20139.017	0.158E-04
14	1	13	13	1	12	20413.180	0.560E-02
15	1	15	14	1	14	20421.769	0.572E-02
14	2	12	13	2	11	20477.196	0.527E-02
15	0	15	14	0	14	20610.610	0.588E-02
21	1	20	21	1	21	21075.508	0.167E-04
15	2	14	14	2	13	21216.312	0.558E-02
15	14	2	14	14	1	21388.444	0.152E-04
15	14	1	14	14	0	21388.444	0.152E-04
15	13	3	14	13	2	21389.293	0.509E-04
15	13	2	14	13	1	21389.293	0.509E-04
15	12	4	14	12	3	21390.364	0.122E-03
15	12	3	14	12	2	21390.364	0.122E-03
15	11	5	14	11	4	21391.745	0.249E-03
15	11	4	14	11	3	21391.745	0.249E-03
15	10	6	14	10	5	21393.566	0.458E-03
15	10	5	14	10	4	21393.566	0.458E-03
15	9	7	14	9	6	21396.037	0.776E-03
15	9	6	14	9	5	21396.037	0.776E-03
15	8	8	14	8	7	21399.513	0.122E-02
15	8	7	14	8	6	21399.513	0.122E-02
15	7	9	14	7	8	21404.627	0.181E-02
15	7	8	14	7	7	21404.627	0.181E-02
15	6	10	14	6	9	21412.613	0.253E-02
15	6	9	14	6	8	21412.615	0.253E-02
15	5	11	14	5	10	21426.092	0.335E-02
15	5	10	14	5	9	21426.242	0.335E-02
15	4	12	14	4	11	21449.277	0.421E-02
15	3	13	14	3	12	21454.970	0.501E-02
15	4	11	14	4	10	21455.316	0.421E-02
15	3	12	14	3	11	21574.904	0.506E-02
16	1	16	15	1	15	21761.891	0.627E-02
15	1	14	14	1	13	21823.313	0.620E-02
28	2	26	28	2	27	21919.011	0.149E-04
16	0	16	15	0	15	21924.856	0.641E-02
15	2	13	14	2	12	21978.245	0.589E-02
16	2	15	15	2	14	22606.773	0.609E-02
22	1	21	22	1	22	22666.100	0.159E-04
16	14	3	15	14	2	22815.116	0.303E-04
16	14	2	15	14	1	22815.116	0.303E-04
16	13	4	15	13	3	22816.146	0.758E-04
16	13	3	15	13	2	22816.146	0.758E-04
16	12	5	15	12	4	22817.447	0.162E-03
16	12	4	15	12	3	22817.447	0.162E-03
16	11	6	15	11	5	22819.123	0.311E-03
16	11	5	15	11	4	22819.123	0.311E-03
16	10	7	15	10	6	22821.333	0.549E-03
16	10	6	15	10	5	22821.333	0.549E-03
16	9	8	15	9	7	22824.333	0.905E-03
16	9	7	15	9	6	22824.333	0.905E-03
16	8	9	15	8	8	22828.552	0.140E-02
16	8	8	15	8	7	22828.552	0.140E-02
16	7	10	15	7	9	22834.761	0.205E-02
16	7	9	15	7	8	22834.761	0.205E-02
16	6	11	15	6	10	22844.458	0.283E-02
16	6	10	15	6	9	22844.462	0.283E-02
16	5	12	15	5	11	22860.799	0.372E-02
16	5	11	15	5	10	22861.071	0.372E-02
16	3	14	15	3	13	22887.711	0.550E-02
16	4	13	15	4	12	22888.037	0.464E-02
16	4	12	15	4	11	22897.546	0.464E-02
16	3	13	15	3	12	23050.493	0.557E-02
17	1	17	16	1	16	23099.673	0.674E-02
16	1	15	15	1	14	23221.906	0.672E-02

17	0	17	16	0	16	23238.196	0.687E-02
16	2	14	15	2	13	23476.227	0.644E-02
29	2	27	29	2	28	23714.483	0.139E-04
17	2	16	16	2	15	23992.984	0.653E-02
17	15	3	16	15	2	24240.943	0.170E-04
17	15	2	16	15	1	24240.943	0.170E-04
17	14	4	16	14	3	24241.939	0.445E-04
17	14	3	16	14	2	24241.939	0.445E-04
17	13	5	16	13	4	24243.175	0.992E-04
17	13	4	16	13	3	24243.175	0.992E-04
17	12	6	16	12	5	24244.735	0.199E-03
17	12	5	16	12	4	24244.735	0.199E-03
23	1	22	23	1	23	24245.771	0.150E-04
17	11	7	16	11	6	24246.745	0.367E-03
17	11	6	16	11	5	24246.745	0.367E-03
17	10	8	16	10	7	24249.396	0.631E-03
17	10	7	16	10	6	24249.396	0.631E-03
17	9	9	16	9	8	24252.995	0.102E-02
17	9	8	16	9	7	24252.995	0.102E-02
17	8	10	16	8	9	24258.057	0.156E-02
17	8	9	16	8	8	24258.057	0.156E-02
17	7	11	16	7	10	24265.507	0.225E-02
17	7	10	16	7	9	24265.507	0.225E-02
17	6	12	16	6	11	24277.146	0.309E-02
17	6	11	16	6	10	24277.155	0.309E-02
17	5	13	16	5	12	24296.712	0.403E-02
17	5	12	16	5	11	24297.187	0.403E-02
17	3	15	16	3	14	24319.141	0.592E-02
17	4	14	16	4	13	24328.109	0.501E-02
17	4	13	16	4	12	24342.640	0.502E-02
18	1	18	17	1	17	24435.337	0.713E-02
17	3	14	16	3	13	24534.697	0.600E-02
18	0	18	17	0	17	24551.548	0.724E-02
17	1	16	16	1	15	24608.153	0.715E-02
17	2	15	16	2	14	24969.310	0.691E-02

W2A: b-type transitions (J''=0-10)

J'	Ka'	Kc'	<--	J''	Ka''	Kc''	Frequency (MHz)	logarithm of intensity
8	2	7		9	1	8	5053.021	0.152E-04
17	1	16		16	2	15	5067.684	0.190E-04
17	3	15		18	2	16	5093.867	0.148E-04
17	3	14		18	2	17	5146.608	0.151E-04
1	1	0		1	0	1	5373.270	0.220E-04
2	1	1		2	0	2	5382.091	0.364E-04
3	1	2		3	0	3	5395.342	0.503E-04
4	1	3		4	0	4	5413.049	0.636E-04
5	1	4		5	0	5	5435.243	0.761E-04
8	2	6		9	1	9	5451.740	0.178E-04
6	1	5		6	0	6	5461.966	0.877E-04
7	1	6		7	0	7	5493.265	0.983E-04
8	1	7		8	0	8	5529.198	0.108E-03
9	1	8		9	0	9	5569.829	0.116E-03
10	1	9		10	0	10	5615.230	0.123E-03
9	0	9		8	1	8	5642.547	0.515E-04
11	1	10		11	0	11	5665.482	0.129E-03
12	1	11		12	0	12	5720.674	0.133E-03
13	1	12		13	0	13	5780.900	0.136E-03
14	1	13		14	0	14	5846.263	0.138E-03
27	2	25		26	3	24	5909.678	0.103E-04
19	1	19		18	2	16	5914.717	0.241E-04
15	1	14		15	0	15	5916.875	0.138E-03
16	1	15		16	0	16	5992.853	0.138E-03
17	1	16		17	0	17	6074.321	0.136E-03
18	1	17		18	0	18	6161.409	0.133E-03
19	1	18		19	0	19	6254.256	0.129E-03
7	2	6		8	1	7	6298.693	0.210E-04
16	3	14		17	2	15	6307.742	0.233E-04
16	3	13		17	2	16	6349.921	0.236E-04
18	1	17		17	2	16	6351.950	0.289E-04
20	1	19		20	0	20	6353.003	0.125E-03
21	1	20		21	0	21	6457.800	0.120E-03
22	1	21		22	0	22	6568.799	0.114E-03
1	1	1		0	0	0	6570.670	0.220E-04

7	2	5	8	1	8	6617.215	0.232E-04
23	1	22	23	0	23	6686.158	0.108E-03
24	1	23	24	0	24	6810.037	0.102E-03
28	2	27	27	3	24	6845.580	0.123E-04
10	0	10	9	1	9	6886.925	0.817E-04
25	1	24	25	0	25	6940.601	0.953E-04
20	1	20	19	2	17	7019.071	0.322E-04
26	1	25	26	0	26	7078.017	0.886E-04
28	2	26	27	3	25	7144.088	0.134E-04
27	1	26	27	0	27	7222.452	0.819E-04
28	1	27	28	0	28	7374.075	0.752E-04
24	4	21	25	3	22	7412.141	0.156E-04
24	4	20	25	3	23	7415.295	0.156E-04
15	3	13	16	2	14	7520.420	0.336E-04
29	1	28	29	0	29	7533.054	0.687E-04
6	2	5	7	1	6	7540.010	0.256E-04
15	3	12	16	2	15	7553.707	0.339E-04
19	1	18	18	2	17	7640.413	0.400E-04
30	1	29	30	0	30	7699.555	0.623E-04
2	1	2	1	0	1	7768.070	0.457E-04
6	2	4	7	1	7	7787.447	0.274E-04
29	2	28	28	3	25	8038.919	0.150E-04
21	1	21	20	2	18	8116.789	0.404E-04
11	0	11	10	1	10	8135.231	0.119E-03
29	2	27	28	3	26	8381.512	0.163E-04
23	4	20	24	3	21	8620.559	0.230E-04
23	4	19	24	3	22	8623.037	0.230E-04
14	3	12	15	2	13	8732.031	0.452E-04
14	3	11	15	2	14	8757.912	0.455E-04
5	2	4	6	1	5	8776.960	0.281E-04
20	1	19	19	2	18	8933.048	0.519E-04
3	1	3	2	0	2	8961.069	0.799E-04
5	2	3	6	1	6	8962.349	0.293E-04
22	1	22	21	2	19	9207.648	0.485E-04
30	2	29	29	3	26	9230.807	0.174E-04
12	0	12	11	1	11	9387.374	0.163E-03
30	2	28	29	3	27	9622.137	0.188E-04
22	4	19	23	3	20	9828.707	0.324E-04
22	4	18	23	3	21	9830.633	0.324E-04
13	3	11	14	2	12	9942.699	0.578E-04
13	3	10	14	2	13	9962.483	0.581E-04
4	2	3	5	1	4	10009.538	0.271E-04
4	2	2	5	1	5	10141.850	0.279E-04
4	1	4	3	0	3	10149.681	0.126E-03
21	1	20	20	2	19	10229.831	0.639E-04
23	1	23	22	2	20	10291.416	0.560E-04
13	0	13	12	1	12	10643.252	0.213E-03
21	4	18	22	3	19	11036.609	0.437E-04
21	4	17	22	3	20	11038.091	0.437E-04
12	3	10	13	2	11	11152.539	0.706E-04
12	3	9	13	2	12	11167.372	0.708E-04
3	2	2	4	1	3	11237.734	0.219E-04
3	2	1	4	1	4	11325.888	0.223E-04
5	1	5	4	0	4	11333.927	0.183E-03
24	1	24	23	2	21	11367.857	0.626E-04
22	1	21	21	2	20	11530.732	0.757E-04
14	0	14	13	1	13	11902.757	0.267E-03
29	5	25	30	4	26	12121.563	0.179E-04
29	5	24	30	4	27	12121.659	0.179E-04
20	4	17	21	3	18	12244.290	0.571E-04
20	4	16	21	3	19	12245.416	0.572E-04
11	3	9	12	2	10	12361.661	0.827E-04
11	3	8	12	2	11	12372.535	0.828E-04
25	1	25	24	2	22	12436.722	0.681E-04
2	2	1	3	1	2	12461.542	0.122E-04
6	1	6	5	0	5	12513.837	0.252E-03
2	2	0	3	1	3	12514.413	0.123E-04
23	1	22	22	2	21	12835.725	0.866E-04
15	0	15	14	1	14	13165.773	0.324E-03
28	5	24	29	4	25	13329.204	0.246E-04
28	5	23	29	4	26	13329.278	0.246E-04
19	4	16	20	3	17	13451.772	0.725E-04
19	4	15	20	3	18	13452.616	0.725E-04
26	1	26	25	2	23	13497.759	0.723E-04
10	3	8	11	2	9	13570.167	0.929E-04
10	3	7	11	2	10	13577.931	0.930E-04
7	1	7	6	0	6	13689.450	0.332E-03

24	1	23	23	2	22	14144.776	0.963E-04
16	0	16	15	1	15	14432.175	0.381E-03
30	2	28	30	1	29	14479.756	0.104E-03
27	5	23	28	4	24	14536.711	0.329E-04
27	5	22	28	4	25	14536.767	0.329E-04
27	1	27	26	2	24	14550.710	0.752E-04
29	2	27	29	1	28	14559.626	0.121E-03
28	2	26	28	1	27	14640.045	0.140E-03
18	4	15	19	3	16	14659.076	0.895E-04
18	4	14	19	3	17	14659.700	0.895E-04
27	2	25	27	1	26	14720.707	0.161E-03
9	3	7	10	2	8	14778.149	0.100E-03
9	3	6	10	2	9	14783.523	0.100E-03
26	2	24	26	1	25	14801.313	0.183E-03
8	1	8	7	0	7	14860.811	0.422E-03
25	2	23	25	1	24	14881.568	0.207E-03
24	2	22	24	1	23	14961.187	0.233E-03
23	2	21	23	1	22	15039.890	0.259E-03
22	2	20	22	1	21	15117.408	0.286E-03
21	2	19	21	1	20	15193.478	0.314E-03
20	2	18	20	1	19	15267.850	0.341E-03
19	2	17	19	1	18	15340.281	0.368E-03
18	2	16	18	1	17	15410.540	0.393E-03
25	1	24	24	2	23	15457.853	0.104E-03
17	2	15	17	1	16	15478.405	0.416E-03
16	2	14	16	1	15	15543.665	0.436E-03
28	1	28	27	2	25	15595.311	0.768E-04
15	2	13	15	1	14	15606.123	0.453E-03
14	2	12	14	1	13	15665.590	0.465E-03
17	0	17	16	1	16	15701.831	0.437E-03
13	2	11	13	1	12	15721.890	0.472E-03
26	5	22	27	4	23	15744.093	0.430E-04
26	5	21	27	4	24	15744.135	0.430E-04
12	2	10	12	1	11	15774.857	0.474E-03
11	2	9	11	1	10	15824.339	0.469E-03
17	4	14	18	3	15	15866.220	0.108E-03
17	4	13	18	3	16	15866.674	0.108E-03
10	2	8	10	1	9	15870.194	0.458E-03
9	2	7	9	1	8	15912.293	0.440E-03
8	2	6	8	1	7	15950.517	0.414E-03
7	2	5	7	1	6	15984.761	0.381E-03
8	3	6	9	2	7	15985.695	0.103E-03
8	3	5	9	2	8	15989.276	0.103E-03
6	2	4	6	1	5	16014.931	0.341E-03
9	1	9	8	0	8	16027.976	0.519E-03
5	2	3	5	1	4	16040.943	0.294E-03
4	2	2	4	1	3	16062.728	0.239E-03
3	2	1	3	1	2	16080.226	0.177E-03
2	2	0	2	1	1	16093.391	0.103E-03
2	2	1	2	1	2	16119.810	0.103E-03
3	2	2	3	1	3	16133.032	0.178E-03
4	2	3	4	1	4	16150.665	0.242E-03
5	2	4	5	1	5	16172.713	0.299E-03
6	2	5	6	1	6	16199.181	0.349E-03
7	2	6	7	1	7	16230.073	0.393E-03
8	2	7	8	1	8	16265.397	0.431E-03
9	2	8	9	1	9	16305.158	0.462E-03
10	2	9	10	1	10	16349.364	0.487E-03
11	2	10	11	1	11	16398.024	0.505E-03
12	2	11	12	1	12	16451.147	0.516E-03
13	2	12	13	1	13	16508.742	0.522E-03
14	2	13	14	1	14	16570.820	0.522E-03
29	1	29	28	2	26	16631.295	0.770E-04
15	2	14	15	1	15	16637.391	0.516E-03
16	2	15	16	1	16	16708.467	0.506E-03
26	1	25	25	2	24	16774.920	0.111E-03
17	2	16	17	1	17	16784.059	0.491E-03
18	2	17	18	1	18	16864.180	0.472E-03
19	2	18	19	1	19	16948.841	0.451E-03
25	5	21	26	4	22	16951.359	0.551E-04
25	5	20	26	4	23	16951.390	0.551E-04
18	0	18	17	1	17	16974.600	0.491E-03
20	2	19	20	1	20	17038.056	0.427E-03
16	4	13	17	3	14	17073.223	0.127E-03
16	4	12	17	3	15	17073.546	0.127E-03
21	2	20	21	1	21	17131.836	0.401E-03
10	1	10	9	0	9	17191.006	0.622E-03

7	3	5	8	2	6	17192.881	0.101E-03
7	3	4	8	2	7	17195.160	0.101E-03
22	2	21	22	1	22	17230.196	0.374E-03
23	2	22	23	1	23	17333.146	0.346E-03
24	2	23	24	1	24	17440.702	0.318E-03
25	2	24	25	1	25	17552.874	0.291E-03
30	1	30	29	2	27	17658.389	0.760E-04
26	2	25	26	1	26	17669.675	0.263E-03
27	2	26	27	1	27	17791.117	0.237E-03
28	2	27	28	1	28	17917.212	0.212E-03
29	2	28	29	1	29	18047.970	0.188E-03
27	1	26	26	2	25	18095.940	0.116E-03
24	5	20	25	4	21	18158.516	0.692E-04
24	5	19	25	4	22	18158.539	0.692E-04
30	2	29	30	1	30	18183.404	0.166E-03
19	0	19	18	1	18	18250.337	0.540E-03
15	4	12	16	3	13	18280.100	0.146E-03
15	4	11	16	3	14	18280.326	0.146E-03
11	1	11	10	0	10	18349.973	0.728E-03
6	3	4	7	2	5	18399.780	0.919E-04
6	3	3	7	2	6	18401.146	0.919E-04
2	2	1	1	1	0	18514.610	0.247E-03
2	2	0	1	1	1	18523.431	0.247E-03
23	5	19	24	4	20	19365.573	0.855E-04
23	5	18	24	4	21	19365.590	0.855E-04
28	1	27	27	2	26	19420.871	0.118E-03
14	4	11	15	3	12	19486.866	0.163E-03
14	4	10	15	3	13	19487.021	0.163E-03
12	1	12	11	0	11	19504.957	0.834E-03
20	0	20	19	1	19	19528.886	0.583E-03
5	3	3	6	2	4	19606.453	0.758E-04
5	3	2	6	2	5	19607.212	0.758E-04
3	2	2	2	1	1	19712.010	0.306E-03
3	2	1	2	1	2	19738.494	0.307E-03
22	5	18	23	4	19	20572.537	0.104E-03
22	5	17	23	4	20	20572.549	0.104E-03
13	1	13	12	0	12	20656.044	0.937E-03
13	4	10	14	3	11	20693.536	0.179E-03
13	4	9	14	3	12	20693.639	0.179E-03
29	1	28	28	2	27	20749.671	0.119E-03
21	0	21	20	1	20	20810.086	0.619E-03
4	3	2	5	2	3	20812.957	0.529E-04
4	3	1	5	2	4	20813.336	0.529E-04
4	2	3	3	1	2	20905.003	0.380E-03
4	2	2	3	1	3	20958.026	0.382E-03
21	5	17	22	4	18	21779.415	0.124E-03
21	5	16	22	4	19	21779.423	0.124E-03
14	1	14	13	0	13	21803.330	0.103E-02
12	4	9	13	3	10	21900.121	0.191E-03
12	4	8	13	3	11	21900.188	0.191E-03
3	3	1	4	2	2	22019.338	0.253E-04
3	3	0	4	2	3	22019.500	0.253E-04
30	1	29	29	2	28	22082.294	0.118E-03
5	2	4	4	1	3	22093.591	0.463E-03
22	0	22	21	1	21	22093.770	0.647E-03
5	2	3	4	1	4	22182.070	0.467E-03
29	6	24	30	5	25	22864.634	0.456E-04
29	6	23	30	5	26	22864.634	0.456E-04
15	1	15	14	0	14	22946.920	0.112E-02
20	5	16	21	4	17	22986.214	0.146E-03
20	5	15	21	4	18	22986.219	0.146E-03
11	4	8	12	3	9	23106.633	0.198E-03
11	4	7	12	3	10	23106.675	0.198E-03
6	2	5	5	1	4	23277.775	0.553E-03
23	0	23	22	1	22	23379.763	0.667E-03
6	2	4	5	1	5	23410.683	0.559E-03
28	6	23	29	5	24	24071.620	0.570E-04
28	6	22	29	5	25	24071.620	0.570E-04
16	1	16	15	0	15	24086.924	0.120E-02
19	5	15	20	4	16	24192.940	0.168E-03
19	5	14	20	4	17	24192.944	0.168E-03
10	4	7	11	3	8	24313.084	0.199E-03
10	4	6	11	3	9	24313.109	0.199E-03
7	2	6	6	1	5	24457.557	0.648E-03
7	2	5	6	1	6	24643.933	0.658E-03
24	0	24	23	1	23	24667.886	0.677E-03
17	1	17	16	0	16	25223.463	0.127E-02

27	6	22	28	5	23	25278.535	0.704E-04
27	6	21	28	5	24	25278.535	0.704E-04
18	5	14	19	4	15	25399.600	0.191E-03
18	5	13	19	4	16	25399.602	0.191E-03
9	4	6	10	3	7	25519.481	0.192E-03
9	4	5	10	3	8	25519.495	0.192E-03
8	2	7	7	1	6	25632.943	0.745E-03
8	2	6	7	1	7	25881.898	0.760E-03
25	0	25	24	1	24	25957.954	0.680E-03
18	1	18	17	0	17	26356.666	0.132E-02
26	6	21	27	5	22	26485.383	0.858E-04
26	6	20	27	5	23	26485.383	0.858E-04
30	3	27	30	2	28	26578.707	0.317E-03
17	5	13	18	4	14	26606.199	0.214E-03
17	5	12	18	4	15	26606.201	0.214E-03
29	3	26	29	2	27	26610.985	0.366E-03
28	3	25	28	2	26	26640.347	0.419E-03
27	3	24	27	2	25	26666.943	0.476E-03
26	3	23	26	2	24	26690.931	0.537E-03
25	3	22	25	2	23	26712.465	0.601E-03
8	4	5	9	3	6	26725.834	0.177E-03
8	4	4	9	3	7	26725.842	0.177E-03
24	3	21	24	2	22	26731.702	0.668E-03
23	3	20	23	2	21	26748.796	0.737E-03
22	3	19	22	2	20	26763.901	0.806E-03
21	3	18	21	2	19	26777.167	0.875E-03
20	3	17	20	2	18	26788.741	0.941E-03
19	3	16	19	2	17	26798.767	0.100E-02
9	2	8	8	1	7	26803.935	0.843E-03
18	3	15	18	2	16	26807.385	0.106E-02
17	3	14	17	2	15	26814.728	0.111E-02
16	3	13	16	2	14	26820.925	0.116E-02
15	3	12	15	2	13	26826.100	0.119E-02
14	3	11	14	2	12	26830.369	0.121E-02
13	3	10	13	2	11	26833.843	0.122E-02
12	3	9	12	2	10	26836.627	0.121E-02
11	3	8	11	2	9	26838.817	0.118E-02
10	3	7	10	2	8	26840.504	0.114E-02
9	3	6	9	2	7	26841.771	0.108E-02
8	3	5	8	2	6	26842.694	0.998E-03
7	3	4	7	2	5	26843.341	0.898E-03
6	3	3	6	2	4	26843.773	0.778E-03
5	3	2	5	2	3	26844.044	0.637E-03
4	3	1	4	2	2	26844.199	0.469E-03
3	3	0	3	2	1	26844.278	0.267E-03
3	3	1	3	2	2	26844.332	0.267E-03
4	3	2	4	2	3	26844.362	0.469E-03
5	3	3	5	2	4	26844.423	0.637E-03
6	3	4	6	2	5	26844.531	0.779E-03
7	3	5	7	2	6	26844.705	0.899E-03
8	3	6	8	2	7	26844.967	0.998E-03
9	3	7	9	2	8	26845.341	0.108E-02
10	3	8	10	2	9	26845.856	0.114E-02
11	3	9	11	2	10	26846.542	0.118E-02
12	3	10	12	2	11	26847.434	0.121E-02
13	3	11	13	2	12	26848.567	0.122E-02
14	3	12	14	2	13	26849.983	0.121E-02
15	3	13	15	2	14	26851.722	0.119E-02
16	3	14	16	2	15	26853.831	0.116E-02
17	3	15	17	2	16	26856.357	0.112E-02
18	3	16	18	2	17	26859.350	0.107E-02
19	3	17	19	2	18	26862.863	0.101E-02
20	3	18	20	2	19	26866.953	0.947E-03
21	3	19	21	2	20	26871.675	0.881E-03
22	3	20	22	2	21	26877.091	0.813E-03
23	3	21	23	2	22	26883.263	0.744E-03
24	3	22	24	2	23	26890.255	0.676E-03
25	3	23	25	2	24	26898.134	0.610E-03
26	3	24	26	2	25	26906.968	0.546E-03
27	3	25	27	2	26	26916.828	0.485E-03
28	3	26	28	2	27	26927.785	0.428E-03
29	3	27	29	2	28	26939.913	0.375E-03
30	3	28	30	2	29	26953.287	0.327E-03
9	2	7	8	1	8	27124.669	0.864E-03
26	0	26	25	1	25	27249.777	0.673E-03
19	1	19	18	0	18	27486.666	0.136E-02
25	6	20	26	5	21	27692.170	0.103E-03

25	6	19	26	5	22	27692.170	0.103E-03
16	5	12	17	4	13	27812.744	0.235E-03
16	5	11	17	4	14	27812.745	0.235E-03
7	4	4	8	3	5	27932.151	0.152E-03
7	4	3	8	3	6	27932.155	0.152E-03
10	2	9	9	1	8	27970.541	0.938E-03
10	2	8	9	1	9	28372.350	0.966E-03
27	0	27	26	1	26	28543.162	0.659E-03
20	1	20	19	0	19	28613.609	0.138E-02
24	6	19	25	5	20	28898.898	0.123E-03
24	6	18	25	5	21	28898.898	0.123E-03
15	5	11	16	4	12	29019.240	0.253E-03
15	5	10	16	4	13	29019.240	0.253E-03
11	2	10	10	1	9	29132.767	0.103E-02
6	4	3	7	3	4	29138.438	0.118E-03
6	4	2	7	3	5	29138.440	0.118E-03
11	2	9	10	1	10	29625.053	0.107E-02
21	1	21	20	0	20	29737.643	0.139E-02
28	0	28	27	1	27	29837.913	0.638E-03
23	6	18	24	5	19	30105.573	0.144E-03
23	6	17	24	5	20	30105.573	0.144E-03
14	5	10	15	4	11	30225.691	0.267E-03
14	5	9	15	4	12	30225.691	0.267E-03
12	2	11	11	1	10	30290.621	0.111E-02
5	4	2	6	3	3	30344.702	0.778E-04
5	4	1	6	3	4	30344.702	0.778E-04
3	3	1	2	2	0	30462.951	0.990E-03
3	3	0	2	2	1	30462.962	0.990E-03
22	1	22	21	0	21	30858.926	0.138E-02
12	2	10	11	1	11	30882.905	0.116E-02
29	0	29	28	1	28	31133.829	0.612E-03
22	6	17	23	5	18	31312.197	0.166E-03
22	6	16	23	5	19	31312.198	0.166E-03
13	5	9	14	4	10	31432.103	0.275E-03
13	5	8	14	4	11	31432.103	0.275E-03
13	2	12	12	1	11	31444.112	0.119E-02
4	4	1	5	3	2	31550.948	0.348E-04
4	4	0	5	3	3	31550.948	0.348E-04
4	3	2	3	2	1	31669.139	0.110E-02
4	3	1	3	2	2	31669.194	0.110E-02
23	1	23	22	0	22	31977.623	0.136E-02
13	2	11	12	1	12	32146.041	0.124E-02
30	0	30	29	1	29	32430.709	0.580E-03
21	6	16	22	5	17	32518.776	0.190E-03
21	6	15	22	5	18	32518.776	0.190E-03
14	2	13	13	1	12	32593.250	0.125E-02
12	5	8	13	4	9	32638.480	0.276E-03
12	5	7	13	4	10	32638.480	0.276E-03
5	3	3	4	2	2	32875.286	0.123E-02
5	3	2	4	2	3	32875.449	0.123E-02
24	1	24	23	0	23	33093.904	0.133E-02
14	2	12	13	1	13	33414.611	0.132E-02
29	7	23	30	6	24	33604.833	0.665E-04
29	7	22	30	6	25	33604.833	0.665E-04
20	6	15	21	5	16	33725.311	0.214E-03
20	6	14	21	5	17	33725.311	0.214E-03
15	2	14	14	1	13	33738.047	0.131E-02
11	5	7	12	4	8	33844.826	0.269E-03
11	5	6	12	4	9	33844.826	0.269E-03
6	3	4	5	2	3	34081.363	0.138E-02
6	3	3	5	2	4	34081.743	0.138E-02
25	1	25	24	0	24	34207.945	0.128E-02
15	2	13	14	1	14	34688.772	0.138E-02
28	7	22	29	6	23	34811.520	0.803E-04
28	7	21	29	6	24	34811.520	0.803E-04
16	2	15	15	1	14	34878.516	0.134E-02
19	6	14	20	5	15	34931.807	0.238E-03
19	6	13	20	5	16	34931.807	0.238E-03