

$^{48}\text{Ti}^{81}\text{Br}$ Assigned Transitions

Transitions are labeled using four columns, the excited state J value (J'), the ground state J value (J''), the observed transition wavenumber (Observed) and the fit residual multiplied by 10^3 (O-C).

[23.48]⁴Γ_{5/2}⁻⁴Φ_{3/2}(0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
4.5	3.5	23375.9354	3.2	32.5	33.5	23369.9803	-1.5
5.5	4.5	23376.1386	0.7	33.5	34.5	23369.8712	-1.7
7.5	6.5	23376.5575	0.7	34.5	35.5	23369.7641	-2.3
10.5	9.5	23377.2023	-1.7	35.5	36.5	23369.6617	-0.4
11.5	10.5	23377.4255	0.7	36.5	37.5	23369.5610	0.8
12.5	11.5	23377.6456	-2.4	37.5	38.5	23369.4609	0.4
13.5	12.5	23377.8671	-6.7	38.5	39.5	23369.3642	1.1
14.5	13.5	23378.1016	-0.4	39.5	40.5	23369.2668	-1.2
15.5	14.5	23378.3324	-0.3	40.5	41.5	23369.1744	-0.7
16.5	15.5	23378.5643	-1.6	41.5	42.5	23369.0853	0.9
17.5	16.5	23378.7974	-4.2	42.5	43.5	23368.9969	1.1
18.5	17.5	23379.0313	-8.4	43.5	44.5	23368.9095	0.0
19.5	18.5	23379.2784	-1.8	44.5	45.5	23368.8248	-0.6
20.5	19.5	23379.5203	-2.9	45.5	46.5	23368.7411	-2.2
21.5	20.5	23379.7648	-3.8	46.5	47.5	23368.6624	-1.0
22.5	21.5	23380.0146	-1.8	47.5	48.5	23368.5830	-2.6
23.5	22.5	23380.2668	0.1	48.5	49.5	23368.5076	-2.3
24.5	23.5	23380.5177	-1.6	49.5	50.5	23368.4359	-0.4
25.5	24.5	23380.7752	0.9	50.5	51.5	23368.3618	-2.9
26.5	25.5	23381.0320	0.3	51.5	52.5	23368.2980	2.9
27.5	26.5	23381.2902	-1.2	52.5	53.5	23368.2294	1.8
28.5	27.5	23381.5530	-0.5	53.5	54.5	23368.1662	4.2
29.5	28.5	23381.8156	-2.4	54.5	55.5	23368.1026	4.2
30.5	29.5	23382.0861	1.4	55.5	56.5	23368.0369	0.2
31.5	30.5	23382.3496	-4.2	56.5	57.5	23367.9796	2.7
32.5	31.5	23382.6261	0.9	57.5	58.5	23367.9189	-0.2
33.5	32.5	23382.8973	-1.5	58.5	59.5	23367.8582	-4.9
34.5	33.5	23383.1738	-0.9	59.5	60.5	23367.8040	-4.9
35.5	34.5	23383.4544	1.6	60.5	61.5	23367.7504	-6.2
36.5	35.5	23383.7315	-1.7	61.5	62.5	23367.6964	-9.6
37.5	36.5	23384.0137	-2.1	62.5	63.5	23367.6463	-10.9
38.5	37.5	23384.2989	-1.7	5.5	5.5	23375.0799	-3.6
39.5	38.5	23384.5865	-1.1	6.5	6.5	23375.0972	-2.8
40.5	39.5	23384.8777	1.0	7.5	7.5	23375.1172	-1.8
41.5	40.5	23385.1666	-1.4	8.5	8.5	23375.1376	-2.9
42.5	41.5	23385.4601	-1.3	9.5	9.5	23375.1622	-2.4
43.5	42.5	23385.7560	-0.9	10.5	10.5	23375.1903	-0.8
44.5	43.5	23386.0505	-4.1	11.5	11.5	23375.2193	-0.9
45.5	44.5	23386.3497	-4.5	12.5	12.5	23375.2506	-1.2
46.5	45.5	23386.6533	-2.7	13.5	13.5	23375.2863	0.4
47.5	46.5	23386.9572	-2.5	14.5	14.5	23375.3224	-0.1
48.5	47.5	23387.2630	-2.5	15.5	15.5	23375.3641	2.5
49.5	48.5	23387.5706	-2.6	16.5	16.5	23375.4054	2.2
50.5	49.5	23387.8811	-1.8	17.5	17.5	23375.4494	2.2
51.5	50.5	23388.1923	-2.3	18.5	18.5	23375.4955	1.8
52.5	51.5	23388.5059	-2.2	19.5	19.5	23375.5438	1.1
53.5	52.5	23388.8211	-2.5	20.5	20.5	23375.5942	0.0

54.5	53.5	23389.1413	0.4	21.5	21.5	23375.6472	-0.8
55.5	54.5	23389.4579	-2.2	22.5	22.5	23375.7036	-0.7
56.5	55.5	23389.7781	-3.0	23.5	23.5	23375.7627	-0.4
57.5	56.5	23390.1041	0.2	24.5	24.5	23375.8234	-0.8
58.5	57.5	23390.4263	-2.2	25.5	25.5	23375.8884	0.6
59.5	58.5	23390.7522	-2.6	26.5	26.5	23375.9538	0.0
60.5	59.5	23391.0824	-0.4	27.5	27.5	23376.0211	-1.0
61.5	60.5	23391.4103	-2.2	28.5	28.5	23376.0926	-0.2
62.5	61.5	23391.7446	0.7	29.5	29.5	23376.1649	-1.0
63.5	62.5	23392.0781	1.2	30.5	30.5	23376.2420	0.7
64.5	63.5	23392.4137	2.2	31.5	31.5	23376.3177	-1.3
65.5	64.5	23392.7559	8.1	32.5	32.5	23376.3971	-2.0
66.5	65.5	23393.0918	6.3	33.5	33.5	23376.4802	-1.3
2.5	3.5	23374.3716	-6.6	34.5	34.5	23376.5655	-0.6
3.5	4.5	23374.1881	-7.3	35.5	35.5	23376.6539	0.8
4.5	5.5	23374.0064	-8.7	36.5	36.5	23376.7417	-0.6
5.5	6.5	23373.8324	-4.9	37.5	37.5	23376.8354	1.7
6.5	7.5	23373.6587	-3.4	38.5	38.5	23376.9291	1.7
7.5	8.5	23373.4866	-2.8	39.5	39.5	23377.0222	-1.1
8.5	9.5	23373.3145	-4.8	40.5	40.5	23377.1193	-2.1
9.5	10.5	23373.1490	-2.7	41.5	41.5	23377.2203	-1.4
10.5	11.5	23372.9853	-1.3	42.5	42.5	23377.3217	-2.4
11.5	12.5	23372.8228	-1.2	43.5	43.5	23377.4330	4.3
12.5	13.5	23372.6590	-5.0	44.5	44.5	23377.5352	-0.2
13.5	14.5	23372.5053	-1.1	45.5	45.5	23377.6456	1.4
14.5	15.5	23372.3512	-0.2	46.5	46.5	23377.7540	-1.1
15.5	16.5	23372.1964	-2.5	47.5	47.5	23377.8671	-0.9
16.5	17.5	23372.0459	-2.9	48.5	48.5	23377.9792	-3.9
17.5	18.5	23371.8995	-1.8	49.5	49.5	23378.1016	1.5
18.5	19.5	23371.7524	-3.9	50.5	50.5	23378.2174	-1.7
19.5	20.5	23371.6103	-3.4	52.5	52.5	23378.4629	-0.2
20.5	21.5	23371.4716	-2.0	53.5	53.5	23378.5867	-1.3
21.5	22.5	23371.3328	-3.2	54.5	54.5	23378.7104	-4.5
22.5	23.5	23371.2000	-0.8	56.5	56.5	23378.9739	-0.3
23.5	24.5	23371.0686	0.6	57.5	57.5	23379.0993	-7.3
24.5	25.5	23370.9342	-3.5	58.5	58.5	23379.2437	2.8
25.5	26.5	23370.8094	-0.5	59.5	59.5	23379.3738	-3.1
26.5	27.5	23370.6807	-3.7	61.5	61.5	23379.6537	-0.6
27.5	28.5	23370.5616	0.3	62.5	62.5	23379.8012	5.6
28.5	29.5	23370.4402	-0.5	63.5	63.5	23379.9402	1.6
29.5	30.5	23370.3208	-1.6	64.5	64.5	23380.0874	4.2
30.5	31.5	23370.2063	-0.2	65.5	65.5	23380.2355	6.0
31.5	32.5	23370.0923	-0.7	66.5	66.5	23380.3852	7.9

[23.48]⁴Γ_{5/2}⁻⁴Φ_{5/2}(0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
3.5	2.5	23244.7788	8.8	11.5	12.5	23241.8477	0.4
4.5	3.5	23244.9796	7.2	12.5	13.5	23241.6833	-1.0
5.5	4.5	23245.1813	4.3	13.5	14.5	23241.5269	3.3

6.5	5.5	23245.3842	0.2	14.5	15.5	23241.3687	3.6
7.5	6.5	23245.5937	0.4	15.5	16.5	23241.2110	2.0
8.5	7.5	23245.8055	0.6	16.5	17.5	23241.0572	2.1
9.5	8.5	23246.0190	0.3	17.5	18.5	23240.9038	0.3
11.5	10.5	23246.4530	-0.3	18.5	19.5	23240.7570	2.8
12.5	11.5	23246.6755	1.4	19.5	20.5	23240.6079	0.8
13.5	12.5	23246.8986	1.5	20.5	21.5	23240.4631	0.8
14.5	13.5	23247.1238	1.5	21.5	22.5	23240.3207	1.0
15.5	14.5	23247.3496	-0.2	22.5	23.5	23240.1819	2.6
16.5	15.5	23247.5797	0.1	23.5	24.5	23240.0422	1.0
17.5	16.5	23247.8152	3.6	24.5	25.5	23239.9085	3.2
18.5	17.5	23248.0444	-1.5	25.5	26.5	23239.7750	3.4
19.5	18.5	23248.2862	3.8	26.5	27.5	23239.6413	1.2
20.5	19.5	23248.5231	2.0	27.5	28.5	23239.5139	3.1
21.5	20.5	23248.7666	4.6	28.5	29.5	23239.3871	3.4
22.5	21.5	23249.0063	1.2	29.5	30.5	23239.2610	2.3
23.5	22.5	23249.2519	1.5	30.5	31.5	23239.1379	2.0
24.5	23.5	23249.4997	1.9	31.5	32.5	23239.0148	-0.5
25.5	24.5	23249.7519	4.4	32.5	33.5	23238.8991	2.4
26.5	25.5	23250.0011	1.8	33.5	34.5	23238.7847	4.4
27.5	26.5	23250.2552	2.0	34.5	35.5	23238.6676	1.6
28.5	27.5	23250.5124	3.1	35.5	36.5	23238.5555	1.7
29.5	28.5	23250.7686	1.1	36.5	37.5	23238.4454	1.8
30.5	29.5	23251.0268	-0.9	37.5	38.5	23238.3357	0.1
32.5	31.5	23251.5581	3.5	38.5	39.5	23238.2313	1.8
33.5	32.5	23251.8253	4.2	39.5	40.5	23238.1282	2.7
34.5	33.5	23252.0918	2.1	40.5	41.5	23238.0268	3.3
35.5	34.5	23252.3634	3.2	41.5	42.5	23237.9244	0.8
36.5	35.5	23252.6349	2.0	42.5	43.5	23237.8270	1.5
37.5	36.5	23252.9117	4.2	43.5	44.5	23237.7290	-0.5
38.5	37.5	23253.1906	6.5	44.5	45.5	23237.6349	-0.5
39.5	38.5	23253.4631	0.5	45.5	46.5	23237.5432	-0.1
40.5	39.5	23253.7430	-0.1	46.5	47.5	23237.4541	1.1
41.5	40.5	23254.0208	-4.8	47.5	48.5	23237.3647	0.0
42.5	41.5	23254.3127	2.8	48.5	49.5	23237.2793	1.1
43.5	42.5	23254.5996	3.5	49.5	50.5	23237.1976	4.1
44.5	43.5	23254.8868	2.5	50.5	51.5	23237.1125	1.8
45.5	44.5	23255.1770	2.8	51.5	52.5	23237.0248	-5.0
46.5	45.5	23255.4672	1.2	53.5	54.5	23236.8768	3.6
47.5	46.5	23255.7603	0.7	54.5	55.5	23236.7990	1.5
48.5	47.5	23256.0551	0.1	55.5	56.5	23236.7249	1.3
49.5	48.5	23256.3497	-2.5	56.5	57.5	23236.6499	-1.4
50.5	49.5	23256.6489	-2.3	57.5	58.5	23236.5848	4.0
51.5	50.5	23256.9491	-2.7	58.5	59.5	23236.5154	3.5
52.5	51.5	23257.2553	1.1	59.5	60.5	23236.4461	1.5
53.5	52.5	23257.5552	-3.0	60.5	61.5	23236.3787	-0.3
54.5	53.5	23257.8624	-1.5	61.5	62.5	23236.3163	1.4
55.5	54.5	23258.1746	3.3	6.5	6.5	23244.1390	2.6
56.5	55.5	23258.4752	-5.0	7.5	7.5	23244.1574	3.6

57.5	56.5	23258.7890	-1.7	8.5	8.5	23244.1764	2.9
58.5	57.5	23259.1036	0.8	9.5	9.5	23244.1974	2.0
59.5	58.5	23259.4151	-1.4	10.5	10.5	23244.2228	3.1
60.5	59.5	23259.7360	4.4	11.5	11.5	23244.2494	3.1
3.5	4.5	23243.2337	-0.8	12.5	12.5	23244.2788	3.7
4.5	5.5	23243.0543	1.3	13.5	13.5	23244.3091	2.9
5.5	6.5	23242.8711	-2.7	14.5	14.5	23244.3408	1.2
6.5	7.5	23242.6977	0.7	15.5	15.5	23244.3802	4.9
7.5	8.5	23242.5229	0.5	16.5	16.5	23244.4149	1.6
8.5	9.5	23242.3504	0.2	17.5	17.5	23244.4569	3.4
9.5	10.5	23242.1826	2.4	18.5	18.5	23244.4959	0.0
10.5	11.5	23242.0135	0.9				

[23.48]⁴Γ_{7/2}-⁴Φ_{5/2} (0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
3.5	2.5	23448.2233	-4.8	23.5	24.5	23444.0209	2.3
4.5	3.5	23448.4418	3.0	24.5	25.5	23443.9295	1.4
5.5	4.5	23448.6523	-1.3	25.5	26.5	23443.8451	3.4
6.5	5.5	23448.8754	2.7	26.5	27.5	23443.7601	0.8
7.5	6.5	23449.0996	3.7	27.5	28.5	23443.6824	1.4
8.5	7.5	23449.3254	2.2	28.5	29.5	23443.6086	2.0
9.5	8.5	23449.5509	-3.8	29.5	30.5	23443.5386	2.2
12.5	11.5	23450.2721	-1.9	30.5	31.5	23443.4695	-0.6
13.5	12.5	23450.5196	-2.5	31.5	32.5	23443.4105	2.7
14.5	13.5	23450.7748	0.6	32.5	33.5	23443.3491	-0.4
15.5	14.5	23451.0346	4.1	33.5	34.5	23443.2981	3.0
16.5	15.5	23451.2928	1.9	34.5	35.5	23443.2481	3.4
17.5	16.5	23451.5586	3.2	35.5	36.5	23443.1957	-2.5
18.5	17.5	23451.8285	4.6	36.5	37.5	23443.1502	-5.5
19.5	18.5	23452.0980	1.4	37.5	38.5	23443.1153	-1.7
20.5	19.5	23452.3725	-0.8	38.5	39.5	23443.0789	-3.4
21.5	20.5	23452.6557	1.7	39.5	40.5	23443.0449	-6.5
22.5	21.5	23452.9406	1.7	4.5	4.5	23447.5657	-9.4
23.5	22.5	23453.2338	6.1	5.5	5.5	23447.5874	-10.6
24.5	23.5	23453.5227	2.1	6.5	6.5	23447.6194	-5.7
25.5	24.5	23453.8232	5.7	7.5	7.5	23447.6494	-7.0
26.5	25.5	23454.1227	4.3	8.5	8.5	23447.6834	-8.4
27.5	26.5	23454.4293	6.0	9.5	9.5	23447.7251	-6.3
28.5	27.5	23454.7327	0.5	10.5	10.5	23447.7695	-5.7
29.5	28.5	23455.0497	4.6	11.5	11.5	23447.8175	-5.6
30.5	29.5	23455.3653	3.4	12.5	12.5	23447.8702	-4.9
31.5	30.5	23455.6852	2.6	13.5	13.5	23447.9269	-4.4
32.5	31.5	23456.0090	1.7	14.5	14.5	23447.9896	-2.0
33.5	32.5	23456.3373	1.4	15.5	15.5	23448.0572	1.2
34.5	33.5	23456.6692	0.9	16.5	16.5	23448.1259	1.4
35.5	34.5	23457.0017	-3.0	17.5	17.5	23448.1990	1.8
36.5	35.5	23457.3432	-1.7	18.5	18.5	23448.2754	1.5
37.5	36.5	23457.6904	1.5	19.5	19.5	23448.3571	2.3
38.5	37.5	23458.0347	-2.1	20.5	20.5	23448.4418	2.1

39.5	38.5	23458.3839	-4.6	21.5	21.5	23448.5329	4.1
40.5	39.5	23458.7365	-7.5	22.5	22.5	23448.6279	6.1
5.5	6.5	23446.3292	-21.2	23.5	23.5	23448.7260	7.0
6.5	7.5	23446.1781	-7.5	24.5	24.5	23448.8301	9.9
7.5	8.5	23446.0193	-5.7	25.5	25.5	23448.9348	9.4
8.5	9.5	23445.8655	-3.0	26.5	26.5	23449.0436	8.9
9.5	10.5	23445.7134	-2.8	27.5	27.5	23449.1550	7.0
10.5	11.5	23445.5653	-2.8	28.5	28.5	23449.2727	7.5
11.5	12.5	23445.4196	-4.5	29.5	29.5	23449.3881	1.6
12.5	13.5	23445.2781	-6.2	30.5	30.5	23449.5142	2.5
13.5	14.5	23445.1490	0.4	31.5	31.5	23449.6430	2.0
14.5	15.5	23445.0189	1.9	33.5	33.5	23449.9138	2.6
15.5	16.5	23444.8865	-3.1	34.5	34.5	23450.0526	0.4
16.5	17.5	23444.7644	-2.0	35.5	35.5	23450.1974	0.3
17.5	18.5	23444.6454	-1.8	36.5	36.5	23450.3448	-1.2
18.5	19.5	23444.5303	-1.9	37.5	37.5	23450.4972	-1.5
19.5	20.5	23444.4229	1.6	38.5	38.5	23450.6520	-3.2
20.5	21.5	23444.3135	-1.0	39.5	39.5	23450.8131	-2.5
21.5	22.5	23444.2111	-0.6	40.5	40.5	23450.9756	-4.2
22.5	23.5	23444.1153	2.2				

[23.48]⁴Γ_{7/2}-⁴Φ_{7/2} (0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
5.5	4.5	23317.7963	5.3	13.5	14.5	23314.2634	-0.5
6.5	5.5	23318.0051	-3.7	14.5	15.5	23314.1287	-0.2
7.5	6.5	23318.2299	-0.7	15.5	16.5	23313.9983	0.4
9.5	8.5	23318.6849	-1.0	16.5	17.5	23313.8688	-1.9
10.5	9.5	23318.9181	-1.3	17.5	18.5	23313.7461	-1.4
11.5	10.5	23319.1555	-1.4	18.5	19.5	23313.6270	-1.2
12.5	11.5	23319.3986	0.3	19.5	20.5	23313.5209	8.1
13.5	12.5	23319.6415	-2.0	20.5	21.5	23313.4005	-0.7
14.5	13.5	23319.8927	0.0	21.5	22.5	23313.2924	-1.2
15.5	14.5	23320.1452	-0.6	22.5	23.5	23313.1900	0.2
16.5	15.5	23320.4080	5.2	23.5	24.5	23313.0910	1.2
17.5	16.5	23320.6645	0.9	24.5	25.5	23312.9916	-2.1
18.5	17.5	23320.9314	3.1	25.5	26.5	23312.9002	-1.3
19.5	18.5	23321.1992	2.3	26.5	27.5	23312.8111	-2.0
20.5	19.5	23321.4681	-1.2	27.5	28.5	23312.7274	-1.1
21.5	20.5	23321.7476	2.1	28.5	29.5	23312.6577	10.0
22.5	21.5	23322.0288	3.2	29.5	30.5	23312.5703	-0.4
23.5	22.5	23322.3147	5.2	30.5	31.5	23312.4949	-2.6
24.5	23.5	23322.5992	1.9	31.5	32.5	23312.4268	-1.3
25.5	24.5	23322.8881	-0.7	32.5	33.5	23312.3605	-1.9
26.5	25.5	23323.1896	5.5	33.5	34.5	23312.2971	-3.4
27.5	26.5	23323.4875	4.3	34.5	35.5	23312.2367	-5.6
28.5	27.5	23323.7880	2.0	36.5	37.5	23312.1350	-2.0
29.5	28.5	23324.0944	1.8	37.5	38.5	23312.0833	-6.7
30.5	29.5	23324.4073	4.4	38.5	39.5	23312.0402	-6.4
31.5	30.5	23324.7175	0.5	5.5	5.5	23316.7312	-2.9

32.5	31.5	23325.0374	2.7	6.5	6.5	23316.7566	-3.2
33.5	32.5	23325.3593	3.2	7.5	7.5	23316.7882	-1.2
34.5	33.5	23325.6842	2.9	8.5	8.5	23316.8229	-0.1
35.5	34.5	23326.0088	-1.2	9.5	9.5	23316.8603	-0.2
36.5	35.5	23326.3383	-4.2	10.5	10.5	23316.9010	-0.9
37.5	36.5	23326.6699	-8.6	11.5	11.5	23316.9497	2.4
38.5	37.5	23327.0130	-5.2	12.5	12.5	23316.9977	1.2
8.5	9.5	23314.9926	-5.0	13.5	13.5	23317.0541	4.4
9.5	10.5	23314.8405	-2.5	14.5	14.5	23317.1151	8.3
10.5	11.5	23314.6904	-1.9	15.5	15.5	23317.1678	-0.1
11.5	12.5	23314.5430	-2.5	16.5	16.5	23317.2359	3.1
12.5	13.5	23314.3995	-3.2	17.5	17.5	23317.3043	2.7

[23.48]⁴Γ_{9/2}-⁴Φ_{7/2} (0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
5.5	4.5	23527.6578	-0.2	13.5	14.5	23524.2772	-3.0
6.5	5.5	23527.8919	3.9	14.5	15.5	23524.1687	-3.6
7.5	6.5	23528.1270	3.3	15.5	16.5	23524.0684	-1.7
8.5	7.5	23528.3676	2.3	16.5	17.5	23523.9733	-0.4
9.5	8.5	23528.6120	-0.7	17.5	18.5	23523.8793	-3.8
10.5	9.5	23528.8666	0.8	18.5	19.5	23523.7939	-4.4
11.5	10.5	23529.1231	-1.6	19.5	20.5	23523.7155	-3.6
12.5	11.5	23529.3933	3.9	20.5	21.5	23523.6424	-3.3
13.5	12.5	23529.6605	0.6	21.5	22.5	23523.5757	-2.4
14.5	13.5	23529.9397	3.6	22.5	23.5	23523.5103	-5.8
15.5	14.5	23530.2155	-2.6	23.5	24.5	23523.4540	-5.8
16.5	15.5	23530.5127	6.9	24.5	25.5	23523.4029	-6.4
17.5	16.5	23530.8066	7.4	25.5	26.5	23523.3589	-5.5
18.5	17.5	23531.1041	5.7	26.5	27.5	23523.3215	-3.6
19.5	18.5	23531.3987	-4.5	27.5	28.5	23523.2848	-6.8
20.5	19.5	23531.7212	7.4	28.5	29.5	23523.2732	9.6
21.5	20.5	23532.0371	7.1	29.5	30.5	23523.2429	1.6
22.5	21.5	23532.3590	7.0	30.5	31.5	23523.2165	-8.1
23.5	22.5	23532.6846	5.0	5.5	5.5	23526.5975	-3.7
24.5	23.5	23533.0018	-11.0	6.5	6.5	23526.6395	0.5
25.5	24.5	23533.3540	2.3	7.5	7.5	23526.6809	-1.7
26.5	25.5	23533.6986	2.4	9.5	9.5	23526.7866	-0.7
27.5	26.5	23534.0482	1.9	10.5	10.5	23526.8480	-0.3
28.5	27.5	23534.4051	3.2	11.5	11.5	23526.9147	-0.4
29.5	28.5	23534.7670	3.8	12.5	12.5	23526.9844	-3.3
30.5	29.5	23535.1289	-1.1	13.5	13.5	23527.0611	-5.0
31.5	30.5	23535.5055	3.1	14.5	14.5	23527.1505	0.3
32.5	31.5	23535.8808	0.5	15.5	15.5	23527.2403	0.2
9.5	10.5	23524.7679	-1.8	16.5	16.5	23527.3376	1.8
10.5	11.5	23524.6351	-3.6	17.5	17.5	23527.4443	7.1
11.5	12.5	23524.5117	-1.7	18.5	18.5	23527.5524	8.1
12.5	13.5	23524.3943	0.4				

[23.61]⁴Γ_{5/2}-⁴Φ_{3/2} (0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
2.5	1.5	23499.6947	2.6	9.5	10.5	23497.4684	3.0
3.5	2.5	23499.9052	1.0	10.5	11.5	23497.3379	2.8
4.5	3.5	23500.1305	8.3	11.5	12.5	23497.2100	-0.6
5.5	4.5	23500.3522	6.2	12.5	13.5	23497.0905	-1.5
6.5	5.5	23500.5814	5.8	13.5	14.5	23496.9793	0.1
7.5	6.5	23500.8165	5.4	14.5	15.5	23496.8704	-2.0
8.5	7.5	23501.0576	5.2	15.5	16.5	23496.7694	-2.0
9.5	8.5	23501.3035	4.0	16.5	17.5	23496.6758	-0.5
10.5	9.5	23501.5553	2.8	17.5	18.5	23496.5852	-2.0
11.5	10.5	23501.8158	4.5	18.5	19.5	23496.5010	-2.9
12.5	11.5	23502.0793	3.3	19.5	20.5	23496.4244	-2.2
13.5	12.5	23502.3525	5.9	20.5	21.5	23496.3490	-6.2
14.5	13.5	23502.6257	2.7	22.5	23.5	23496.2275	-2.8
15.5	14.5	23502.9160	10.7	23.5	24.5	23496.1746	-2.2
16.5	15.5	23503.1944	1.0	24.5	25.5	23496.1275	-1.7
17.5	16.5	23503.4916	4.2	26.5	27.5	23496.0548	2.8
18.5	17.5	23503.7919	4.6	27.5	28.5	23496.0239	1.5
19.5	18.5	23504.0951	2.0	28.5	29.5	23496.0089	10.0
20.5	19.5	23504.4090	4.2	29.5	30.5	23495.9937	12.4
21.5	20.5	23504.7268	4.4	30.5	31.5	23495.9789	9.0
22.5	21.5	23505.0467	0.8	31.5	32.5	23495.9764	12.0
23.5	22.5	23505.3747	-0.7	32.5	33.5	23495.9789	13.8
24.5	23.5	23505.7120	1.3	33.5	34.5	23495.9937	21.9
25.5	24.5	23506.0479	-4.2	34.5	35.5	23496.0017	17.1
26.5	25.5	23506.3977	-1.6	2.5	2.5	23499.2110	-1.8
27.5	26.5	23506.7517	-0.8	3.5	3.5	23499.2367	3.5
28.5	27.5	23507.1103	-1.4	4.5	4.5	23499.2600	0.6
29.5	28.5	23507.4752	-1.7	5.5	5.5	23499.2924	0.9
30.5	29.5	23507.8458	-2.3	6.5	6.5	23499.3274	-2.1
31.5	30.5	23508.2237	-1.6	7.5	7.5	23499.3718	-1.4
32.5	31.5	23508.6062	-2.2	8.5	8.5	23499.4192	-3.6
33.5	32.5	23508.9930	-4.7	9.5	9.5	23499.4785	0.2
34.5	33.5	23509.3892	-3.7	10.5	10.5	23499.5399	0.3
35.5	34.5	23509.7907	-3.5	11.5	11.5	23499.6093	2.5
36.5	35.5	23510.2007	-0.9	12.5	12.5	23499.6800	0.2
37.5	36.5	23510.6110	-4.1	13.5	13.5	23499.7611	2.4
38.5	37.5	23511.0323	-2.4	14.5	14.5	23499.8414	-2.1
39.5	38.5	23511.4573	-3.1	15.5	15.5	23499.9352	1.1
40.5	39.5	23511.8902	-2.0	16.5	16.5	23500.0313	0.6
41.5	40.5	23512.3275	-2.7	17.5	17.5	23500.1353	2.2
42.5	41.5	23512.7738	-0.5	18.5	18.5	23500.2434	2.0
43.5	42.5	23513.2235	-1.1	19.5	19.5	23500.3585	2.9
44.5	43.5	23513.6806	-0.5	20.5	20.5	23500.4776	1.8
45.5	44.5	23514.1440	0.2	21.5	21.5	23500.6020	0.1
46.5	45.5	23514.6135	0.7	22.5	22.5	23500.7367	2.8
47.5	46.5	23515.0865	-1.5	23.5	23.5	23500.8742	2.4
48.5	47.5	23515.5695	0.1	24.5	24.5	23501.0173	1.6

49.5	48.5	23516.0568	-0.4	25.5	25.5	23501.1677	2.1
50.5	49.5	23516.5520	0.8	26.5	26.5	23501.3224	1.0
51.5	50.5	23517.0609	9.3	27.5	27.5	23501.4808	-2.4
2.5	3.5	23498.5462	4.4	28.5	28.5	23501.6537	2.7
3.5	4.5	23498.3745	4.0	29.5	29.5	23501.8218	-3.0
4.5	5.5	23498.2086	3.6	30.5	30.5	23502.0035	-1.1
5.5	6.5	23498.0483	2.9	31.5	31.5	23502.2012	10.7
6.5	7.5	23497.8921	0.5	32.5	32.5	23502.3832	0.8
7.5	8.5	23497.7437	0.0	33.5	33.5	23502.5876	7.3
8.5	9.5	23497.6019	0.3	34.5	34.5	23502.7925	8.1

[23.61]⁴Γ_{5/2}-⁴Φ_{5/2} (0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
4.5	3.5	23369.1592	-3.1	40.5	39.5	23380.7533	-5.3
5.5	4.5	23369.3847	-0.4	41.5	40.5	23381.1835	-4.2
6.5	5.5	23369.6096	-3.9	42.5	41.5	23381.6228	0.0
7.5	6.5	23369.8444	-3.1	2.5	3.5	23367.5856	3.7
8.5	7.5	23370.0839	-3.3	3.5	4.5	23367.4098	0.2
9.5	8.5	23370.3298	-2.7	4.5	5.5	23367.2407	-2.2
10.5	9.5	23370.5803	-3.1	5.5	6.5	23367.0803	-1.6
11.5	10.5	23370.8321	-7.8	6.5	7.5	23366.9261	-0.4
12.5	11.5	23371.0953	-6.8	7.5	8.5	23366.7753	-1.4
13.5	12.5	23371.3618	-8.1	8.5	9.5	23366.6326	0.1
14.5	13.5	23371.6375	-5.8	9.5	10.5	23366.4965	2.5
15.5	14.5	23371.9138	-8.6	10.5	11.5	23366.3628	1.7
16.5	15.5	23372.1988	-8.3	11.5	12.5	23366.2351	1.2
17.5	16.5	23372.4904	-7.1	12.5	13.5	23366.1115	-0.8
18.5	17.5	23372.7866	-7.0	13.5	14.5	23365.9975	1.2
19.5	18.5	23373.0943	-1.0	14.5	15.5	23365.8865	0.4
20.5	19.5	23373.3998	-2.9	15.5	16.5	23365.7820	0.5
21.5	20.5	23373.7144	-1.4	16.5	17.5	23365.6819	-0.7
22.5	21.5	23374.0317	-2.9	17.5	18.5	23365.5885	-0.9
23.5	22.5	23374.3569	-2.2	18.5	19.5	23365.5004	-1.4
24.5	23.5	23374.6894	0.1	19.5	20.5	23365.4201	0.1
25.5	24.5	23375.0225	-2.7	20.5	21.5	23365.3390	-4.9
26.5	25.5	23375.3625	-4.4	21.5	22.5	23365.2703	-3.2
27.5	26.5	23375.7137	-0.6	22.5	23.5	23365.2046	-4.2
28.5	27.5	23376.0631	-4.4	24.5	25.5	23365.0948	-2.0
29.5	28.5	23376.4231	-3.3	25.5	26.5	23365.0490	-0.4
30.5	29.5	23376.7826	-8.5	26.5	27.5	23365.0086	0.8
31.5	30.5	23377.1547	-6.9	3.5	3.5	23368.2755	2.2
32.5	31.5	23377.5363	-1.6	4.5	4.5	23368.2954	-3.2
33.5	32.5	23377.9133	-6.7	5.5	5.5	23368.3274	-2.1
34.5	33.5	23378.3018	-6.1	6.5	6.5	23368.3645	-1.4
35.5	34.5	23378.6947	-7.0	7.5	7.5	23368.4055	-2.6
36.5	35.5	23379.0986	-2.7	8.5	8.5	23368.4549	-0.9
37.5	36.5	23379.5046	-2.2	9.5	9.5	23368.5045	-4.7
38.5	37.5	23379.9145	-3.6	10.5	10.5	23368.5626	-5.6
39.5	38.5	23380.3313	-4.1				

[23.61]⁴Γ_{7/2}⁻⁴Φ_{5/2}(0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
3.5	2.5	23575.5732	-2.2	19.5	19.5	23575.5455	6.1
4.5	3.5	23575.7814	-0.8	20.5	20.5	23575.6099	2.3
5.5	4.5	23575.9819	-10.3	21.5	21.5	23575.6820	2.8
6.5	5.5	23576.2060	0.4	22.5	22.5	23575.7570	2.8
7.5	6.5	23576.4231	0.8	23.5	23.5	23575.8347	2.1
8.5	7.5	23576.6439	1.6	24.5	24.5	23575.9138	-0.6
9.5	8.5	23576.8658	0.3	25.5	25.5	23575.9998	0.1
10.5	9.5	23577.0909	-1.2	26.5	26.5	23576.0902	1.8
11.5	10.5	23577.3228	0.8	27.5	27.5	23576.1780	-2.5
12.5	11.5	23577.5536	-1.7	28.5	28.5	23576.2760	-0.1
13.5	12.5	23577.7928	1.0	29.5	29.5	23576.3748	-0.4
14.5	13.5	23578.0323	0.6	30.5	30.5	23576.4795	1.7
15.5	14.5	23578.2738	-1.1	3.5	4.5	23574.0323	-7.6
16.5	15.5	23578.5235	2.1	4.5	5.5	23573.8572	-5.6
17.5	16.5	23578.7743	3.0	5.5	6.5	23573.6817	-7.3
18.5	17.5	23579.0235	-1.1	6.5	7.5	23573.5179	-0.7
19.5	18.5	23579.2840	2.8	7.5	8.5	23573.3515	0.1
20.5	19.5	23579.5393	-1.9	8.5	9.5	23573.1874	-0.2
21.5	20.5	23579.8064	1.9	9.5	10.5	23573.0237	-3.4
22.5	21.5	23580.0733	2.1	10.5	11.5	23572.8730	3.1
23.5	22.5	23580.3415	0.2	11.5	12.5	23572.7133	-2.7
24.5	23.5	23580.6187	3.8	12.5	13.5	23572.5637	-1.8
25.5	24.5	23580.8939	2.1	13.5	14.5	23572.4197	1.4
26.5	25.5	23581.1674	-4.7	14.5	15.5	23572.2749	0.4
28.5	27.5	23581.7435	0.4	15.5	16.5	23572.1348	0.8
30.5	29.5	23582.3312	3.2	16.5	17.5	23571.9985	1.6
31.5	30.5	23582.6265	0.9	17.5	18.5	23571.8648	1.6
32.5	31.5	23582.9230	-3.7	18.5	19.5	23571.7368	4.0
33.5	32.5	23583.2259	-5.4	19.5	20.5	23571.6053	-0.6
34.5	33.5	23583.5404	1.0	20.5	21.5	23571.4833	1.0
35.5	34.5	23583.8443	-6.8	21.5	22.5	23571.3648	2.6
4.5	4.5	23574.9151	-3.4	22.5	23.5	23571.2484	2.9
5.5	5.5	23574.9381	1.5	23.5	24.5	23571.1330	0.8
6.5	6.5	23574.9588	0.8	24.5	25.5	23571.0219	-0.4
7.5	7.5	23574.9821	-0.7	25.5	26.5	23570.9202	4.3
8.5	8.5	23575.0102	-0.7	26.5	27.5	23570.8145	1.5
9.5	9.5	23575.0425	0.3	27.5	28.5	23570.7141	0.6
10.5	10.5	23575.0775	0.6	28.5	29.5	23570.6177	0.1
11.5	11.5	23575.1146	-0.4	29.5	30.5	23570.5270	1.9
12.5	12.5	23575.1589	2.6	30.5	31.5	23570.4339	-2.2
13.5	13.5	23575.2006	-0.4	31.5	32.5	23570.3535	2.8
14.5	14.5	23575.2499	0.9	32.5	33.5	23570.2684	-0.4
15.5	15.5	23575.2997	-0.7	33.5	34.5	23570.1874	-3.1
16.5	16.5	23575.3557	0.6	34.5	35.5	23570.1113	-4.5
17.5	17.5	23575.4161	2.9	35.5	36.5	23570.0426	-2.0
18.5	18.5	23575.4778	3.2				

[23.61]⁴Γ_{9/2}-⁴Φ_{7/2} (0,0)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
4.5	3.5	23651.8823	-2.4	25.5	25.5	23651.3329	-2.0
5.5	4.5	23652.0858	4.1	26.5	26.5	23651.3669	3.8
6.5	5.5	23652.2826	3.0	27.5	27.5	23651.3916	-1.3
7.5	6.5	23652.4834	5.0	28.5	28.5	23651.4163	-7.8
8.5	7.5	23652.6785	0.4	29.5	29.5	23651.4590	2.1
9.5	8.5	23652.8810	2.3	30.5	30.5	23651.4944	3.1
10.5	9.5	23653.0791	-1.2	31.5	31.5	23651.5267	-0.7
11.5	10.5	23653.2843	1.5	32.5	32.5	23651.5651	-0.1
12.5	11.5	23653.4856	-0.7	4.5	5.5	23649.9633	0.1
13.5	12.5	23653.6917	0.9	5.5	6.5	23649.7778	1.9
14.5	13.5	23653.8996	3.2	6.5	7.5	23649.5867	-2.8
15.5	14.5	23654.1054	2.4	7.5	8.5	23649.3979	-6.1
16.5	15.5	23654.3063	-4.3	8.5	9.5	23649.2204	1.0
17.5	16.5	23654.5170	-2.4	9.5	10.5	23649.0366	0.8
22.5	21.5	23655.5810	0.4	10.5	11.5	23648.8528	-0.4
23.5	22.5	23655.7988	2.2	11.5	12.5	23648.6684	-3.1
24.5	23.5	23656.0118	-2.1	12.5	13.5	23648.4922	1.4
25.5	24.5	23656.2317	-0.9	13.5	14.5	23648.3111	-0.1
26.5	25.5	23656.4539	1.2	14.5	15.5	23648.1333	0.7
27.5	26.5	23656.6718	-2.5	15.5	16.5	23647.9569	1.9
28.5	27.5	23656.8995	2.2	16.5	17.5	23647.7795	0.9
29.5	28.5	23657.1230	1.0	17.5	18.5	23647.6060	2.7
30.5	29.5	23657.3488	0.6	18.5	19.5	23647.4279	-1.2
31.5	30.5	23657.5767	0.7	19.5	20.5	23647.2571	0.9
32.5	31.5	23657.8075	2.0	20.5	21.5	23647.0847	0.3
33.5	32.5	23658.0403	3.5	21.5	22.5	23646.9154	1.4
34.5	33.5	23658.2711	1.2	22.5	23.5	23646.7464	1.6
35.5	34.5	23658.5079	3.0	23.5	24.5	23646.5767	-0.2
36.5	35.5	23658.7474	5.6	24.5	25.5	23646.4092	-1.2
37.5	36.5	23658.9853	4.7	25.5	26.5	23646.2448	-0.5
38.5	37.5	23659.2256	4.0	26.5	27.5	23646.0825	0.8
39.5	38.5	23659.4636	-1.0	27.5	28.5	23645.9175	-2.1
40.5	39.5	23659.7091	-0.7	28.5	29.5	23645.7577	-1.3
41.5	40.5	23659.9523	-4.9	29.5	30.5	23645.5989	-1.1
11.5	11.5	23651.0714	-1.8	30.5	31.5	23645.4408	-1.9
14.5	14.5	23651.1071	-3.4	31.5	32.5	23645.2874	0.3
15.5	15.5	23651.1231	-1.9	32.5	33.5	23645.1306	-2.6
16.5	16.5	23651.1385	-2.1	33.5	34.5	23644.9804	-0.7
18.5	18.5	23651.1721	-3.1	34.5	35.5	23644.8283	-2.6
19.5	19.5	23651.1938	-0.4	35.5	36.5	23644.6813	-1.4
21.5	21.5	23651.2369	1.0	36.5	37.5	23644.5331	-3.3
22.5	22.5	23651.2555	-3.2	37.5	38.5	23644.3927	0.6
23.5	23.5	23651.2862	3.5	38.5	39.5	23644.2486	-1.3
24.5	24.5	23651.3082	0.1	39.5	40.5	23644.1092	-0.8
25.5	25.5	23651.3329	-2.0				

[23.48]⁴Γ_{5/2}⁻⁴Φ_{3/2}(1,1)

J'	J''	Observed	O-C	J'	J''	Observed	O-C
13.5	12.5	23414.1393	10.2	15.5	16.5	23408.3230	-1.4
14.5	13.5	23414.3631	8.0	16.5	17.5	23408.1632	-0.9
15.5	14.5	23414.5929	9.7	17.5	18.5	23408.0064	0.5
16.5	15.5	23414.8191	5.8	18.5	19.5	23407.8517	1.8
17.5	16.5	23415.0522	6.7	19.5	20.5	23407.6982	2.1
18.5	17.5	23415.2874	7.6	20.5	21.5	23407.5455	1.1
19.5	18.5	23415.5186	2.5	21.5	22.5	23407.3947	-0.3
20.5	19.5	23415.7530	-1.5	22.5	23.5	23407.2513	3.5
21.5	20.5	23415.9915	-3.4	23.5	24.5	23407.1068	4.0
22.5	21.5	23416.2384	1.0	24.5	25.5	23406.9584	-1.6
23.5	22.5	23416.4765	-5.4	25.5	26.5	23406.8203	0.9
24.5	23.5	23416.7237	-4.7	26.5	27.5	23406.6852	4.1
25.5	24.5	23416.9739	-3.1	27.5	28.5	23406.5471	2.2
26.5	25.5	23417.2247	-3.0	28.5	29.5	23406.4116	0.6
27.5	26.5	23417.4772	-3.2	29.5	30.5	23406.2836	4.2
28.5	27.5	23417.7301	-5.0	30.5	31.5	23406.1545	4.5
29.5	28.5	23417.9843	-7.5	31.5	32.5	23406.0234	0.6
30.5	29.5	23418.2488	-1.8	32.5	33.5	23405.9007	2.8
32.5	31.5	23418.7668	-7.4	33.5	34.5	23405.7772	2.0
33.5	32.5	23419.0356	-3.5	34.5	35.5	23405.6522	-2.6
34.5	33.5	23419.3015	-4.5	35.5	36.5	23405.5364	-0.3
35.5	34.5	23419.5740	-0.9	36.5	37.5	23405.4190	-1.9
36.5	35.5	23419.8479	2.1	37.5	38.5	23405.3052	-2.1
37.5	36.5	23420.1227	3.9	38.5	39.5	23405.1935	-2.5
38.5	37.5	23420.4006	6.9	39.5	40.5	23405.0838	-3.3
39.5	38.5	23420.6768	6.1	6.5	6.5	23411.3387	5.8
6.5	7.5	23409.8665	1.4	10.5	10.5	23411.4098	0.9
7.5	8.5	23409.6721	-13.2	12.5	12.5	23411.4528	-6.8
8.5	9.5	23409.5021	-5.6	14.5	14.5	23411.5182	-0.5
9.5	10.5	23409.3257	-6.5	16.5	16.5	23411.5869	0.6
10.5	11.5	23409.1542	-4.6	19.5	19.5	23411.6986	-5.0
11.5	12.5	23408.9855	-2.1	20.5	20.5	23411.7510	4.1
12.5	13.5	23408.8160	-2.6	21.5	21.5	23411.7897	-2.7
13.5	14.5	23408.6512	-0.5	22.5	22.5	23411.8464	6.4
14.5	15.5	23408.4844	-2.6				