Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary Information

Approaching the free rotor limit: Extremely low methyl torsional barrier observed in the microwave spectrum of 2,4-dimethylfluorobenzene

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Table S-1: Nuclear coordinates in the inertial principal axis system for 24DMFB calculated at the MP2/6-31G(d,p), MP2/6-311++G(d,p) and B3LYP-D3BJ/6-311++G(d,p) levels of theory. The atoms are numbered according to Figure 1.

	MP2/6-31G(d,p)			**MP2/6-311++G(d,p)**			**B3LYP-D3BJ/6-311++G(d,p)**		
	a **/ Å**	***b*** **/ Å**	***c*** **/ Å**	***a*** **/ Å**	***b*** **/ Å**	***c*** **/ Å**	***a*** **/ Å**	***b*** **/ Å**	***c*** **/ Å**
C1	–1.091619	–0.628612	0.000027	–1.096500	–0.631568	–0.000035	–1.091250	–0.629009	0.000018
C2	–0.771234	0.729658	0.000016	–0.777654	0.729623	0.000096	–0.773706	0.727524	–0.000005
C3	0.586871	1.056668	–0.000063	0.584872	1.056407	–0.000217	0.583444	1.051135	–0.000051
C4	1.593234	0.080372	–0.000091	1.595743	0.080524	0.000068	1.589622	0.078124	–0.000066
C5	1.213607	–1.265283	–0.000065	1.215617	–1.268300	–0.000191	1.210594	–1.264464	–0.000061
C6	–0.134445	–1.630962	0.000009	–0.136321	–1.634647	0.000080	–0.136174	–1.626682	–0.000013
C7	–1.863904	1.760590	–0.000004	–1.865088	1.771408	0.000003	–1.855623	1.772807	–0.000009
C8	3.044420	0.484241	0.000086	3.049769	0.487213	0.000115	3.043051	0.482334	0.000075
F9	–2.408442	–0.974162	0.000038	–2.406196	–0.981016	0.000059	–2.406108	–0.983031	0.000055
H10	–2.501595	1.654757	0.877392	–2.505279	1.668577	0.881431	–2.499327	1.675536	0.878454
H11	–2.501481	1.654846	–0.877495	–2.504889	1.668866	–0.881743	–2.499321	1.675537	–0.878477
H12	–1.442291	2.764004	0.000073	–1.431384	2.774402	0.000267	–1.422714	2.774134	–0.000007
H13	3.287972	1.079436	0.880823	3.290835	1.083595	0.886104	3.287934	1.081304	0.882321
H14	3.287098	1.083247	–0.878295	3.289171	1.089412	–0.882360	3.287233	1.084557	–0.880131
H15	3.693098	–0.390488	–0.002119	3.701484	–0.390691	–0.003356	3.696356	–0.392022	–0.001769
H16	0.865638	2.105793	–0.000096	0.863316	2.109806	–0.000178	0.862004	2.100719	–0.000089
H17	1.973090	–2.038030	–0.000093	1.977625	–2.044121	–0.000146	1.969233	–2.038997	–0.000105
H18	–0.447126	–2.666130	–0.000018	–0.447741	–2.67466	–0.000059	–0.446170	–2.664100	–0.000021

Table S-2: Rotation constants of 24DMFB (in MHz) calculated at different levels of theory. The difference between the calculated and the experimental (in MHz) are given as Δ*A*, Δ*B* and Δ*C*.

Method/Basis set	***A***	**Δ*A***	***B***	**Δ*B***	***C***	**Δ*C***
B3LYP-D3/6-31G(d,p)	3007.7	9.7	1276.9	–6.9	906.4	–2.7
B3LYP-D3/6-31+G(d,p)	2987.5	–10.5	1275.2	–8.6	903.7	–5.4
B3LYP-D3/6-31++G(d,p)	2987.4	–10.6	1275.2	–8.6	903.7	–5.4
B3LYP-D3/6-311G(d,p)	3011.8	13.8	1280.1	–3.7	908.4	–0.7
B3LYP-D3/6-311+G(d,p)	3001.9	3.9	1280.3	–3.5	907.6	–1.5
B3LYP-D3/6-311++G(d,p)	3001.9	3.9	1280.3	–3.5	907.6	–1.5
B3LYP-D3/6-311G(2d,2p)	3024.1	26.1	1284.5	0.7	911.7	2.6
B3LYP-D3/6-311+G(2d,2p)	3013.4	15.4	1284.4	0.6	910.6	1.5
B3LYP-D3/6-311++G(2d,2p)	3013.4	15.4	1284.4	0.6	910.6	1.5
B3LYP-D3/6-311G(df,pd)	3022.7	24.7	1284.7	0.9	911.7	2.6
B3LYP-D3/6-311+G(df,pd)	3012.6	14.6	1284.9	1.2	910.9	1.8
B3LYP-D3/6-311++G(df,pd)	3012.6	14.6	1284.9	1.2	910.9	1.8
B3LYP-D3/6-311G(2df,2pd)	3029.6	31.6	1286.4	2.6	913.1	4.0
B3LYP-D3/6-311+G(2df,2pd)	3018.4	20.4	1286.3	2.5	912.0	2.9
B3LYP-D3/6-311++G(2df,2pd)	3018.3	20.3	1286.3	2.5	912.0	2.9
B3LYP-D3/6-311G(3df,3pd)	3026.8	28.8	1287.3	3.5	913.3	4.2
B3LYP-D3/6-311+G(3df,3pd)	3017.7	19.7	1287.1	3.3	912.4	3.3
B3LYP-D3/6-311++G(3df,3pd)	3017.8	19.8	1287.0	3.3	912.4	3.3
B3LYP-D3/cc-pVDZ	3000.0	2.1	1273.1	–10.6	903.9	–5.2
B3LYP-D3/aug-cc-pVDZ	2984.5	–13.5	1274.1	–9.7	903.0	–6.1
B3LYP-D3/cc-pVTZ	3020.8	22.8	1286.3	2.5	912.3	3.2
B3LYP-D3/aug-cc-pVTZ	3016.5	18.5	1286.4	2.6	911.9	2.8
B3LYP-D3BJ/6-31G(d,p)	3007.7	9.7	1278.9	–4.9	907.4	–1.7
B3LYP-D3BJ/6-31+G(d,p)	2987.4	–10.5	1277.2	–6.6	904.7	–4.3
B3LYP-D3BJ/6-31++G(d,p)	2987.4	–10.6	1277.3	–6.5	904.7	–4.3
B3LYP-D3BJ/6-311G(d,p)	3011.6	13.7	1282.2	–1.6	909.4	0.3
B3LYP-D3BJ/6-311+G(d,p)	3001.7	3.8	1282.4	–1.4	908.6	–0.5
B3LYP-D3BJ/6-311++G(d,p)	3001.7	3.7	1282.4	–1.4	908.6	–0.5
B3LYP-D3BJ/6-311G(2d,2p)	3023.9	25.9	1286.6	2.8	912.7	3.6
B3LYP-D3BJ/6-311+G(2d,2p)	3013.2	15.2	1286.5	2.7	911.6	2.5
B3LYP-D3BJ/6-311++G(2d,2p)	3013.1	15.1	1286.5	2.7	911.6	2.5
B3LYP-D3BJ/6-311G(df,pd)	3022.5	24.5	1286.8	3.0	912.7	3.6
B3LYP-D3BJ/6-311+G(df,pd)	3012.3	14.3	1287.1	3.3	911.9	2.8
B3LYP-D3BJ/6-311++G(df,pd)	3012.3	14.3	1287.1	3.3	911.9	2.8
B3LYP-D3BJ/6-311G(2df,2pd)	3029.4	31.5	1288.5	4.7	914.1	5.1
B3LYP-D3BJ/6-311+G(2df,2pd)	3018.1	20.1	1288.4	4.6	913.1	4.0

B3LYP-D3BJ/6-311++G(2df,2pd)	3018.0	20.0	1288.4	4.6	913.1	4.0
B3LYP-D3BJ/6-311G(3df,3pd)	3026.6	28.6	1289.4	5.6	914.3	5.2
B3LYP-D3BJ/6-311+G(3df,3pd)	3017.8	19.8	1289.1	5.3	913.4	4.3
B3LYP-D3BJ/6-311++G(3df,3pd)	3017.5	19.5	1289.1	5.3	913.4	4.3
B3LYP-D3BJ/cc-pVDZ	3000.1	2.1	1275.2	–8.6	905.0	–4.1
B3LYP-D3BJ/aug-cc-pVDZ	2984.5	–13.5	1276.2	–7.6	904.0	–5.1
B3LYP-D3BJ/cc-pVTZ	3020.6	22.6	1288.4	4.6	913.3	4.2
B3LYP-D3BJ/aug-cc-pVTZ	3016.2	18.2	1288.4	4.6	912.9	3.8
CAM-B3LYP-D3BJ/6-311G(d,p)	3037.1	39.1	1291.1	7.3	916.2	7.1
CAM-B3LYP-D3BJ/6-311+G(d,p)	3027.2	29.2	1291.3	7.6	915.4	6.3
CAM-B3LYP-D3BJ/6-311++G(d,p)	3027.2	29.2	1291.3	7.5	915.4	6.3
CAM-B3LYP-D3BJ/cc-pVDZ	3025.5	27.5	1284.0	0.2	911.7	2.6
CAM-B3LYP-D3BJ/aug-cc-pVDZ	3008.9	11.0	1285.0	1.2	910.7	1.6
CAM-B3LYP-D3BJ/cc-pVTZ	3045.4	47.4	1297.4	13.6	920.1	11.0
CAM-B3LYP-D3BJ/aug-cc-pVTZ	3041.1	43.1	1297.4	13.6	919.7	10.6
CCSD/cc-pVDZ	2975.0	–22.9	1264.8	–19.0	897.6	–11.5
M06-2X/6-31G(d,p)	3029.7	31.7	1285.3	1.5	912.6	3.5
M06-2X/6-31+G(d,p)	3013.6	15.6	1283.9	0.1	910.5	1.4
M06-2X/6-31++G(d,p)	3013.5	15.5	1283.9	0.1	910.5	1.4
M06-2X/6-311G(d,p)	3033.3	35.3	1287.8	4.1	914.2	5.1
M06-2X/6-311+G(d,p)	3025.9	27.9	1288.1	4.3	913.7	4.6
M06-2X/6-311++G(d,p)	3025.9	27.9	1288.1	4.3	913.7	4.6
M06-2X/6-311G(2d,2p)	3045.3	47.4	1291.7	7.9	917.2	8.1
M06-2X/6-311+G(2d,2p)	3036.9	38.9	1291.6	7.8	916.4	7.3
M06-2X/6-311++G(2d,2p)	3036.8	38.8	1291.6	7.8	916.4	7.3
M06-2X/6-311G(df,pd)	3042.4	44.4	1291.4	7.6	916.8	7.7
M06-2X/6-311+G(df,pd)	3034.4	36.5	1291.8	8.0	916.3	7.2
M06-2X/6-311++G(df,pd)	3034.5	36.5	1291.8	8.0	916.3	7.2
M06-2X/6-311G(2df,2pd)	3050.2	52.2	1293.1	9.3	918.3	9.3
M06-2X/6-311+G(2df,2pd)	3040.9	42.9	1293.2	9.4	917.5	8.5
M06-2X/6-311++G(2df,2pd)	3040.8	42.8	1293.2	9.4	917.5	8.5
M06-2X/6-311G(3df,3pd)	3047.7	49.7	1293.7	9.9	918.4	9.3
M06-2X/6-311+G(3df,3pd)	3040.5	42.6	1293.5	9.8	917.7	8.6
M06-2X/6-311++G(3df,3pd)	3040.6	42.7	1293.5	9.7	917.7	8.6
M06-2X/cc-pVDZ	3024.6	26.6	1282.3	–1.5	910.8	1.7
M06-2X/aug-cc-pVDZ	3011.2	13.3	1283.3	–0.5	910.0	0.9
M06-2X/cc-pVTZ	3041.4	43.4	1293.2	9.5	917.6	8.5
M06-2X/aug-cc-pVTZ	3038.6	40.6	1293.3	9.5	917.4	8.3

MN15/6-31G(d,p)	3024.6	26.6	1281.4	–2.4	910.2	1.1
MN15/6-31+G(d,p)	3005.6	7.7	1279.9	–3.9	907.8	–1.3
MN15/6-31++G(d,p)	3005.5	7.5	1279.9	–3.9	907.8	–1.3
MN15/6-311G(d,p)	3032.0	34.0	1285.8	2.0	913.1	4.0
MN15/6-311+G(d,p)	3024.3	26.3	1286.0	2.2	912.5	3.4
MN15/6-311++G(d,p)	3024.3	26.3	1286.0	2.2	912.5	3.4
MN15/6-311G(2d,2p)	3043.5	45.6	1289.3	5.5	915.8	6.8
MN15/6-311+G(2d,2p)	3034.4	36.4	1289.3	5.5	915.0	5.9
MN15/6-311++G(2d,2p)	3034.4	36.4	1289.3	5.5	915.0	5.9
MN15/6-311G(df,pd)	3044.5	46.5	1290.8	7.0	916.7	7.6
MN15/6-311+G(df,pd)	3035.9	37.9	1291.1	7.3	916.1	7.0
MN15/6-311++G(df,pd)	3035.8	37.9	1291.1	7.3	916.0	7.0
MN15/6-311G(2df,2pd)	3049.7	51.7	1291.2	7.4	917.3	8.2
MN15/6-311+G(2df,2pd)	3039.6	41.7	1291.3	7.5	916.5	7.4
MN15/6-311++G(2df,2pd)	3039.6	41.6	1291.4	7.6	916.5	7.4
MN15/6-311G(3df,3pd)	3049.6	51.6	1292.9	9.1	918.2	9.1
MN15/6-311+G(3df,3pd)	3041.5	43.5	1292.7	8.9	917.3	8.3
MN15/6-311++G(3df,3pd)	3041.8	43.8	1292.7	8.9	917.4	8.3
MN15/cc-pVDZ	3021.1	23.1	1278.3	–5.5	908.4	–0.7
MN15/aug-cc-pVDZ	3006.0	8.0	1280.3	–3.5	908.0	–1.1
MN15/cc-pVTZ	3041.1	43.1	1292.3	8.5	917.1	8.0
MN15/aug-cc-pVTZ	3039.5	41.6	1292.7	8.9	917.2	8.1
PBE0/6-31G(d,p)	2978.6	–19.4	1266.9	–16.9	898.9	–10.2
PBE0/6-31+G(d,p)	2957.1	–40.9	1265.5	–18.3	896.2	–12.9
PBE0/6-31++G(d,p)	2957.0	–41.0	1265.5	–18.3	896.2	–12.9
PBE0/6-311G(d,p)	2983.0	–14.9	1270.8	–13.0	901.2	–7.9
PBE0/6-311+G(d,p)	2972.2	–25.8	1270.9	–12.9	900.2	–8.8
PBE0/6-311++(Gd,p)	2972.2	–25.8	1270.8	–12.9	900.2	–8.9
PBE0/6-311G(2d,2p)	2993.9	–4.1	1274.4	–9.4	903.9	–5.2
PBE0/6-311+G(2d,2p)	2981.8	–16.2	1274.2	–9.5	902.8	–6.3
PBE0/6-311++G(2d,2p)	2981.7	–16.2	1274.3	–9.5	902.8	–6.3
PBE0/6-311G(df,pd)	2993.3	–4.6	1274.7	–9.0	904.1	–5.0
PBE0/6-311+G(df,pd)	2981.4	–16.5	1275.2	–8.6	903.3	–5.8
PBE0/6-311++G(df,pd)	2981.5	–16.5	1275.2	–8.6	903.2	–5.8
PBE0/6-311G(2df,2pd)	2999.7	1.7	1276.1	–7.7	905.3	–3.8
PBE0/6-311+G(2df,2pd)	2986.3	–11.7	1276.2	–7.6	904.2	–4.9
PBE0/6-311++G(2df,2pd)	2986.2	–11.8	1276.2	–7.6	904.2	–4.9
PBE0/6-311G(3df,3pd)	2996.6	–1.3	1277.3	–6.5	905.6	–3.5
PBE0/6-311+G(3df,3pd)	2986.3	–11.7	1277.0	–6.8	904.6	–4.5
PBE0/6-311++G(3df,3pd)	2986.4	–11.6	1277.0	–6.8	904.6	–4.5

PBE0/cc-pVDZ	2973.3	–24.6	1264.0	–19.8	897.0	–12.1
PBE0/aug-cc-pVDZ	2955.2	–42.8	1265.0	–18.8	895.8	–13.3
PBE0/cc-pVTZ	2990.0	–8.0	1276.3	–7.5	904.5	–4.6
PBE0/aug-cc-pVTZ	2984.8	–13.2	1276.2	–7.6	904.0	–5.1
PBE0-D3/6-31G(d,p)	2980.8	–17.1	1267.0	–16.8	899.1	–10.0
PBE0-D3/6-31+G(d,p)	2959.5	–38.4	1265.5	–18.3	896.4	–12.7
PBE0-D3/6-31++G(d,p)	2959.5	–38.5	1265.5	–18.2	896.4	–12.7
PBE0-D3/6-311G(d,p)	2985.3	–12.6	1270.8	–13.0	901.4	–7.7
PBE0-D3/6-311+G(d,p)	2974.6	–23.3	1270.9	–12.9	900.5	–8.6
PBE0-D3/6-311++G(d,p)	2974.6	–23.4	1270.9	–12.9	900.5	–8.6
PBE0-D3/6-311G(2d,2p)	2996.1	–1.9	1274.4	–9.4	904.2	–4.9
PBE0-D3/6-311+G(2d,2p)	2984.2	–13.7	1274.3	–9.5	903.0	–6.1
PBE0-D3/6-311++G(2d,2p)	2984.2	–13.8	1274.3	–9.5	903.0	–6.1
PBE0-D3/6-311G(df,pd)	2995.6	–2.4	1274.8	–9.0	904.3	–4.7
PBE0-D3/6-311+G(df,pd)	2983.9	–14.1	1275.2	–8.5	903.5	–5.6
PBE0-D3/6-311++G(df,pd)	2983.9	–14.1	1275.2	–8.6	903.5	–5.6
PBE0-D3/6-311G(2df,2pd)	3002.0	4.0	1276.1	–7.7	905.5	–3.6
PBE0-D3/6-311+G(2df,2pd)	2988.8	–9.2	1276.2	–7.5	904.4	–4.7
PBE0-D3/6-311++G(2df,2pd)	2988.6	–9.3	1276.3	–7.5	904.4	–4.7
PBE0-D3/6-311G(3df,3pd)	2998.9	0.9	1277.3	–6.5	905.9	–3.2
PBE0-D3/6-311+G(3df,3pd)	2988.7	–9.2	1277.0	–6.8	904.8	–4.3
PBE0-D3/6-311++G(3df,3pd)	2988.8	–9.1	1277.0	–6.8	904.8	–4.3
PBE0-D3/cc-pVDZ	2975.5	–22.5	1264.1	–19.7	897.2	–11.8
PBE0-D3/aug-cc-pVDZ	2957.7	–40.3	1265.0	–18.8	896.0	–13.0
PBE0-D3/cc-pVTZ	2992.3	–5.7	1276.3	–7.5	904.8	–4.3
PBE0-D3/aug-cc-pVTZ	2987.2	–10.8	1276.2	–7.6	904.2	–4.9
ωB97X-D/6-31G(d,p)	3015.9	17.9	1285.8	2.0	911.6	2.6
ωB97X-D/6-31+G(d,p)	3000.9	2.9	1284.4	0.7	909.6	0.5
ωB97X-D/6-31++G(d,p)	3000.9	2.9	1284.5	0.7	909.6	0.5
ωB97XD/6-311G(d,p)	3013.9	16.0	1289.3	5.5	913.2	4.1
ωB97XD/6-311+G(d,p)	3013.9	16.0	1289.3	5.5	913.2	4.1
ωB97XD/6-311++G(d,p)	3021.3	23.3	1289.1	5.3	913.8	4.7
ωB97XD/6-311G(2d,2p)	3032.6	34.7	1293.1	9.3	916.8	7.7
ωB97X-D/6-311+G(2d,2p)	3024.4	26.5	1293.0	9.2	916.0	6.9
ωB97X-D/6-311++G(2d,2p)	3024.4	26.4	1293.0	9.2	916.0	6.9
ωB97X-D/6-311G(df,pd)	3030.9	32.9	1293.3	9.5	916.7	7.6
ωB97X-D/6-311+G(df,pd)	3022.9	24.9	1293.6	9.8	916.2	7.1
ωB97X-D/6-311++G(df,pd)	3023.0	25.0	1293.6	9.8	916.2	7.1
ωB97X-D/6-311G(2df,2pd)	3037.8	39.8	1294.9	11.1	918.1	9.0

ωB97X-D/6-311+G(2df,2pd)	3028.6	30.6	1294.9	11.1	917.3	8.2
ωB97X-D/6-311++G(2df,2pd)	3028.5	30.6	1294.9	11.1	917.3	8.2
ωB97X-D/6-311G(3df,3pd)	3035.3	37.3	1295.7	12.0	918.3	9.3
ωB97X-D/6-311+G(3df,3pd)	3028.4	30.4	1295.6	11.8	917.6	8.5
ωB97X-D/6-311++G(3df,3pd)	3028.4	30.5	1295.5	11.8	917.6	8.5
ωB97X-D/cc-pVDZ	3008.8	10.8	1281.9	–1.9	909.2	0.1
ωB97X-D/aug-cc-pVDZ	2996.1	–1.9	1283.0	–0.8	908.5	–0.6
ωB97X-D/cc-pVTZ	3030.5	32.5	1295.2	11.4	917.6	8.5
ωB97X-D/aug-cc-pVTZ	3027.8	29.9	1295.3	11.6	917.5	8.4
MP2/6-31G(d,p)	3013.0	15.0	1279.2	–4.6	908.0	–1.1
MP2/6-31+G(d,p)	2991.5	–6.5	1276.6	–7.2	904.8	–4.3
MP2/6-31++G(d,p)	2991.8	–6.2	1276.2	–7.6	904.6	–4.5
MP2/6-311G(d,p)	2999.7	1.7	1277.3	-6.5	905.9	–3.2
MP2/6-311+G(d,p)	2989.8	–8.2	1276.8	–6.9	904.8	–4.3
MP2/6-311++G(d,p)	2989.7	–8.3	1276.7	–7.1	904.7	–4.4
MP2/6-311G(2d,2p)	3021.0	23.1	1282.2	–1.5	910.2	1.1
MP2/6-311+G(2d,2p)	3009.6	11.7	1282.1	–1.7	909.1	0.0
MP2/6-311++G(2d,2p)	3009.6	11.6	1282.1	–1.7	909.1	0.0
MP2/6-311G(df,pd)	3021.7	23.7	1286.8	3.0	912.7	3.6
MP2/6-311+G(df,pd)	3010.8	12.8	1286.3	2.5	911.4	2.3
MP2/6-311++G(df,pd)	3010.7	12.7	1286.2	2.5	911.4	2.3
MP2/6-311G(2df,2pd)	3037.3	39.3	1288.8	5.0	915.0	5.9
MP2/6-311+G(2df,2pd)	3025.0	27.0	1288.4	4.6	913.7	4.6
MP2/6-311++G(2df,2pd)	3024.9	26.9	1288.4	4.6	913.7	4.6
MP2/6-311G(3df,3pd)	3029.1	31.1	1288.0	4.2	913.9	4.8
MP2/6-311+G(3df,3pd)	3019.9	21.9	1287.4	3.6	912.7	3.6
MP2/6-311++G(3df,3pd)	3020.1	22.1	1287.4	3.6	912.7	3.7
MP2/cc-pVDZ	2980.0	–18.0	1265.8	–18.0	898.5	–10.6
MP2/aug-cc-pVDZ	2959.3	–38.7	1263.6	–20.2	895.5	–13.6
MP2/cc-pVTZ	3021.0	23.1	1287.0	3.3	912.7	3.6
MP2/aug-cc-pVTZ	3015.4	17.4	1286.5	2.7	911.9	2.8
Experimental	**2998.0**		**1283.8**		**909.1**	

Table S-3. Coefficients of Fourier expansion for the one-dimensional potential energy curves of 24DMFB given in Figures 2 and 3 calculated at the B3LYP-D3BJ/6-311++G(d,p), MP2/6-311++G(d,p) and MP2/6-311G(d,p) levels of theory. The potential is expanded as $V(\alpha) = \sum_{i=0}^{n} a_i f_i$.

	B3LYP-D3BJ/6-311++G(d,p)			
	***o*-Me**		***p*-Me**	
f_i	a_i / Hartree	a_i /cm^{-1}	a_i / Hartree	a_i /cm^{-1}
1	–410.2653163		–410.2657503	
cos(3α)	–0.000463388	–101.70	–0.000027632	–6.06
cos(6α)	0.000008680	1.91	0.000010146	2.23

	MP2/6-311++G(d,p)			
	***o*-Me**		***p*-Me**	
f_i	a_i / Hartree	a_i /cm^{-1}	a_i / Hartree	a_i /cm^{-1}
1	–409.0633023		–409.0637305	
cos(3α)	–0.000536196	–117.68	–0.000017509	–3.84
cos(6α)	0.000063160	13.86	0.000063209	13.87
cos(9α)	–	–	0.000002456	0.54

	MP2/6-31G(d,p)			
	***o*-Me**		***p*-Me**	
f_i	a_i / Hartree	a_i /cm^{-1}	a_i / Hartree	a_i /cm^{-1}
1	–408.8909866		–408.8913773	
cos(3α)	–0.000461471	–101.28	–0.000019337	–4.24
cos(6α)	0.000036636	8.04	0.000051809	11.37
cos(9α)	–	–	–0.000003114	–0.68

Table S-4. Coefficients of Fourier expansion for the two-dimensional potential energy surface of 24DMFB given in Figure 4 calculated at the B3LYP-D3BJ/6-311++G(d,p), MP2/6-311++G(d,p) and MP2/6-311G(d,p) levels of theory. The potential is expanded as $V(\alpha) = \sum_{i=0}^{n} a_i f_i$.

		B3LYP-D3BJ/ 6-311++G(d,p)		**MP2/ 6-311++G(d,p)**		**MP2/ 6-31G(d,p)**	
i	f_i	a_i / Hartree	a_i /cm^{-1}	a_i / Hartree	a_i /cm^{-1}	a_i / Hartree	a_i /cm^{-1}
0	1	–410.2652946		–409.0632178		–408.8909247	
1	cos(3α_1)	0.000462578	101.52	0.000543278	119.24	0.000471359	103.45
2	cos(3α_2)	0.000001395	0.31	0.000003791	0.83	0.000001457	0.32
3	cos(6α_1)	0.000006685	1.47	0.000033305	7.31	0.000020280	4.45
4	cos(6α_2)	0.000010325	2.27	0.000061306	13.46	0.000050444	11.07
5	cos(3α_1)cos(3α_2)	–0.000027476	–6.03	–0.000018683	–4.10	–0.000023375	–5.13
6	sin(3α_1)sin(3α_2)	–	–	0.000031097	6.83	–0.000001988	–0.44

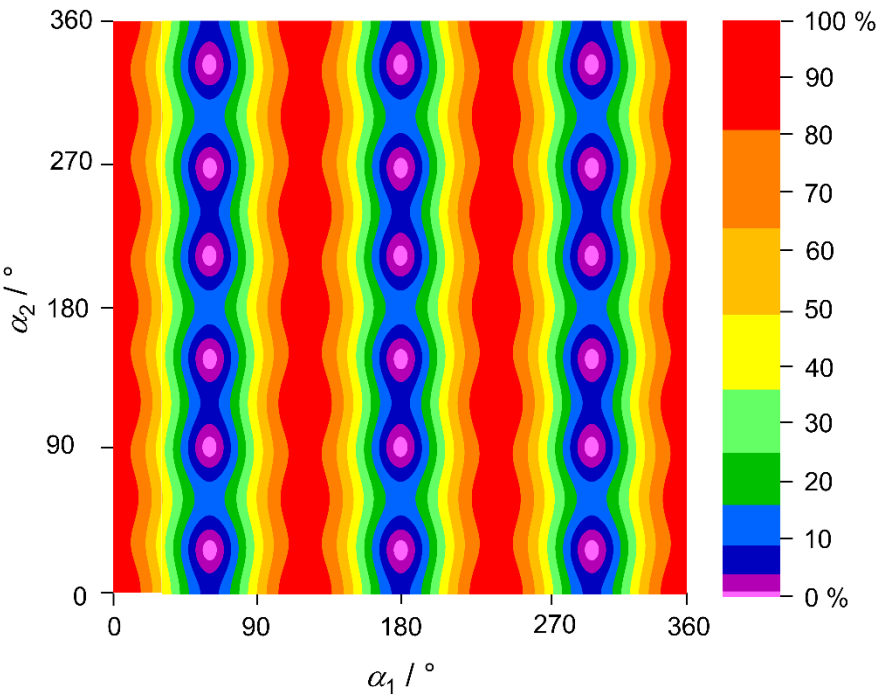

Figure S-1. A two-dimensional potential energy surface of 24DMFB in dependance on the dihedral angles α_1 = ∠(C_3,C_2,C_7,H_{12}) and α_2= ∠(C_5,C_4,C_8,H_{15}) calculated at the MP2/6-31G(d,p) level of theory. The dihedral angles α_1 and α_2 were varied in steps of 10° while all other geometry parameters were optimized. The numbers in the color code indicate the energy (in percent) relative to the energetic minimum (0%) and maximum (100%) with E_{min} = –408.891426, and E_{max} = –408.890357 Hartree (100%).

Table S-5. Fitted frequencies (ν_{obs}) of 24DMFB. The $\nu_{obs} - \nu_{calc}$ residuals are obtained with the *XIAM*$_{mod}$ and *BELGI-C*$_s$*-2Tops* programs.

J'	K_a'	K_c'	*J*	K_a	K_c	Species	ν_{obs}	$\nu_{obs} - \nu_{calc}$	$\nu_{obs} - \nu_{calc}$
Upper level			Lower level				MHz	*XIAM* / kHz	*BELGI* / kHz
2	0	2	1	0	1	(00)	4333.4249	24.9	1
2	1	1	1	1	0	(00)	4762.4717	34.1	0
2	1	2	1	0	1	(00)	5779.1966	108.4	1
2	1	2	1	1	1	(00)	4011.7336	9.3	–5
2	2	0	1	1	1	(00)	10493.8848	300.6	2
2	2	1	1	1	0	(00)	10064.8360	289.5	1
3	0	3	2	0	2	(00)	6372.8336	34.3	1
3	1	2	2	1	1	(00)	7107.3961	50.6	1
3	1	3	2	0	2	(00)	7431.9246	103	0
3	1	3	2	1	2	(00)	5986.1543	20.9	1
3	2	1	2	1	2	(00)	13270.6252	322.3	2
3	2	1	2	2	0	(00)	6788.4779	35.0	0
3	2	2	2	1	1	(00)	11883.0184	288.7	1
3	2	2	2	2	1	(00)	6580.6465	25.8	–8
3	3	0	3	2	1	(00)	9550.4607	355.6	1
3	3	1	3	2	2	(00)	9807.1074	356.8	1
4	0	4	3	0	3	(00)	8292.6417	41.1	1
4	1	3	3	1	2	(00)	9401.8697	64.1	2
4	1	4	3	0	3	(00)	8988.2414	93.0	0
4	1	4	3	1	3	(00)	7929.1510	24.8	1
4	2	2	3	1	3	(00)	16497.9156	350.6	4
4	2	2	3	2	1	(00)	9213.4437	48.2	3
4	2	3	3	1	2	(00)	13507.8615	279.3	–1
4	2	3	3	2	2	(00)	8732.2412	43.2	1
4	3	1	4	2	2	(00)	9234.2848	346.5	–3
4	3	2	3	3	1	(00)	8868.5307	48.9	8
4	3	2	4	2	3	(00)	9943.3883	353.9	–2
4	4	0	4	3	1	(00)	13568.7902	305.5	3
4	4	1	4	3	2	(00)	13602.0320	306.5	4
5	0	5	4	0	4	(00)	10119.3810	39.9	–2
5	0	5	4	1	4	(00)	9423.7839	–9.3	3
5	1	4	4	1	3	(00)	11618.4966	72.8	2
5	1	4	4	2	3	(00)	7512.5056	–141.6	6
5	1	5	4	0	4	(00)	10534.9414	79.6	0
5	1	5	4	1	4	(00)	9839.3384	24.5	–1
5	2	3	4	2	2	(00)	11694.1571	58.6	3

5	2	4	4	1	3	(00)	14954.6644	264.8	–1
5	2	4	4	2	3	(00)	10848.6692	46.2	–1
5	2	4	5	1	5	(00)	8835.3842	337.1	–2
5	3	2	4	3	1	(00)	11204.6107	47.2	1
5	3	2	5	2	3	(00)	8744.7368	333.5	–7
5	3	3	4	3	2	(00)	11106.9647	49.4	3
5	3	3	5	2	4	(00)	10201.6803	353.7	–1
5	4	1	4	4	0	(00)	11089.7140	53.9	10
5	4	1	5	3	2	(00)	13453.8826	301.3	0
5	4	2	4	4	1	(00)	11086.8190	44.4	0
5	4	2	5	3	3	(00)	13581.8839	299.1	–1
5	5	0	5	4	1	(00)	17482.4820	67.0	12
5	5	1	5	4	2	(00)	17485.7104	70.6	15
6	0	6	5	0	5	(00)	11904.7974	37.9	–1
6	0	6	5	1	5	(00)	11489.2413	2.4	2
6	1	5	5	1	4	(00)	13726.1036	83.7	6
6	1	5	5	2	4	(00)	10389.9349	–109.1	8
6	1	6	5	0	5	(00)	12135.6603	66.0	3
6	1	6	5	1	5	(00)	11720.0998	26.2	1
6	2	4	5	2	3	(00)	14166.8505	66.7	3
6	2	5	5	1	4	(00)	16259.2982	241.8	–2
6	2	5	5	2	4	(00)	12923.1338	53.3	4
6	2	5	6	0	6	(00)	10269.2722	383.4	–4
6	2	5	6	1	6	(00)	10038.4134	359.3	–4
6	3	3	5	3	2	(00)	13586.9565	50.6	4
6	3	3	6	2	4	(00)	8164.8418	316.4	–7
6	3	4	5	3	3	(00)	13341.0087	50.9	2
6	3	4	6	1	5	(00)	13152.7577	517.3	–4
6	3	4	6	2	5	(00)	10619.5555	351.6	–3
6	4	2	5	4	1	(00)	13352.6276	46.0	1
6	4	2	6	3	3	(00)	13219.5547	297.7	–2
6	4	3	5	4	2	(00)	13339.8509	47.2	2
6	4	3	6	3	4	(00)	13580.7267	296.0	0
6	5	1	5	5	0	(00)	13296.8992	42.8	1
6	5	1	6	4	2	(00)	17426.7496	59.9	8
6	5	2	5	5	1	(00)	13296.6531	41.3	0
6	5	2	6	4	3	(00)	17442.5101	62.2	10
7	0	7	6	0	6	(00)	13686.8064	34.2	2
7	0	7	6	1	6	(00)	13455.9484	11.0	3
7	1	6	6	1	5	(00)	15702.2764	80.7	1
7	1	6	6	2	5	(00)	13169.0780	–81.2	6

7	1	6	7	0	7	(00)	9751.5456	269.8	2
7	1	6	7	1	7	(00)	9629.8115	251.0	–1
7	1	7	6	0	6	(00)	13808.5363	48.8	1
7	1	7	6	1	6	(00)	13577.6772	24.4	1
7	2	5	6	2	4	(00)	16577.8623	70.8	2
7	2	6	6	1	5	(00)	17484.5005	211.3	–4
7	2	6	6	2	5	(00)	14951.3024	49.8	1
7	2	6	7	0	7	(00)	11533.7696	400.3	–3
7	2	6	7	1	7	(00)	11412.0393	385.4	–3
7	3	4	6	3	3	(00)	16059.4238	45.7	3
7	3	4	7	2	5	(00)	7646.4041	292.1	–5
7	3	5	6	3	4	(00)	15557.8054	48.8	2
7	3	5	7	1	6	(00)	13008.2828	481.5	–7
7	3	5	7	2	6	(00)	11226.0596	351.7	–1
7	4	3	6	4	2	(00)	15648.0812	42.8	1
7	4	3	7	3	4	(00)	12808.2115	294.1	–4
7	4	4	6	4	3	(00)	15606.6285	42.7	1
7	5	2	6	5	1	(00)	15548.0732	38.0	0
7	5	2	7	4	3	(00)	17326.7418	55.4	7
7	5	3	6	5	2	(00)	15546.7419	37.3	–1
7	5	3	7	4	4	(00)	17382.6218	55.1	7
8	0	8	7	0	7	(00)	15478.8442	26.2	2
8	0	8	7	1	7	(00)	15357.1143	11.6	2
8	1	7	7	1	6	(00)	17554.1598	76.4	1
8	1	7	7	2	6	(00)	15771.9354	–54.6	5
8	1	7	8	0	8	(00)	11826.8599	318.7	–1
8	1	7	8	1	8	(00)	11765.0277	310.6	0
8	1	8	7	0	7	(00)	15540.6774	35.3	2
8	1	8	7	1	7	(00)	15418.9468	20.0	2
8	2	6	7	2	5	(00)	18892.6349	70.4	3
8	2	6	7	3	5	(00)	12125.0505	–224.6	13
8	2	7	7	1	6	(00)	18714.5864	176.5	–3
8	2	7	7	2	6	(00)	16932.3613	44.8	1
8	2	7	8	0	8	(00)	12987.2872	419.5	–4
8	2	7	8	1	8	(00)	12925.4540	410.4	–3
8	3	5	7	3	4	(00)	18606.7429	38.9	4
8	3	5	8	2	6	(00)	7360.5128	261.3	–4
8	3	6	7	3	5	(00)	17744.2847	42.4	1
8	3	6	8	2	7	(00)	12037.9827	349.0	–1
8	4	4	7	4	3	(00)	17991.6367	33.4	1
8	4	4	8	3	5	(00)	12193.1062	289.5	–5

8	4	5	7	4	4	(00)	17882.5015	34.0	1
8	5	3	8	4	4	(00)	17152.1554	50.8	5
8	5	4	7	5	3	(00)	17811.8169	26.8	–2
8	5	4	8	4	5	(00)	17311.9388	49.4	6
8	6	2	7	6	1	(00)	17752.9054	20.5	–3
8	6	3	7	6	2	(00)	17752.7875	22.9	–1
8	7	1	7	7	0	(00)	17716.8778	18.7	1
8	7	2	7	7	1	(00)	17716.8661	8.3	–9
9	0	9	8	0	8	(00)	17281.0824	16.2	2
9	1	8	8	1	7	(00)	19325.0153	64.9	0
9	1	8	8	2	7	(00)	18164.5890	–34.9	4
9	1	9	8	0	8	(00)	17311.6355	21.2	1
9	1	9	8	1	8	(00)	17249.8034	13.2	3
9	2	7	8	2	6	(00)	21084.8908	63.7	2
9	2	8	8	1	7	(00)	20029.8104	136.5	–3
9	2	8	8	2	7	(00)	18869.3839	36.5	1
9	3	6	8	3	5	(00)	21175.7469	27.6	3
9	3	6	9	2	7	(00)	7451.3690	225.3	–2
9	3	7	8	3	6	(00)	19889.2882	31.6	1
9	3	7	9	2	8	(00)	13057.8861	343.3	–1
9	4	5	8	4	4	(00)	20403.6575	16.4	1
9	4	5	9	3	6	(00)	11421.0170	278.5	–7
9	4	6	8	4	5	(00)	20158.8991	19.6	0
9	5	4	8	5	3	(00)	20109.1479	12.9	–1
9	5	4	9	4	5	(00)	16857.6454	46.9	3
9	5	5	8	5	4	(00)	20092.5734	12.4	–1
9	6	3	8	6	2	(00)	20012.1348	4.9	–4
9	6	4	8	6	3	(00)	20011.5811	5.4	–3
9	7	2	8	7	1	(00)	19960.3545	–7.5	1
9	7	3	8	7	2	(00)	19960.3545	2.4	–9
9	8	1	8	8	0	(00)	19927.5564	–13.9	–7
9	8	2	8	8	1	(00)	19927.5564	–13.8	–7
10	0	10	9	0	9	(00)	19090.2981	4.3	2
10	0	10	9	1	9	(00)	19059.7449	–0.8	2
10	1	9	9	1	8	(00)	21068.9814	46.8	–1
10	1	10	9	0	9	(00)	19105.0796	7.5	2
10	1	10	9	1	9	(00)	19074.5265	2.6	2
10	2	8	9	2	7	(00)	23133.3035	50.2	0
10	2	8	10	1	9	(00)	11403.3653	176.9	2
10	2	8	10	2	9	(00)	10998.7898	129.5	5
10	2	9	9	1	8	(00)	21473.5573	94.7	–4

10	2	9	9	2	8	(00)	20768.7636	24.5	1
10	3	7	9	3	6	(00)	23699.3248	11.6	2
10	3	7	10	2	8	(00)	8017.3908	187.2	1
10	3	8	9	3	7	(00)	21984.9651	14.3	–1
10	3	8	10	2	9	(00)	14274.0875	333.0	–3
10	4	6	9	4	5	(00)	22902.5379	–7.4	2
10	4	6	10	3	7	(00)	10624.2288	258.3	–9
10	4	7	9	4	6	(00)	22423.9926	–1.8	–1
10	5	5	9	5	4	(00)	22432.6913	–9.4	–1
10	5	6	9	5	5	(00)	22387.9534	–10.2	–2
10	6	4	9	6	3	(00)	22286.4613	–17.8	–4
10	6	5	9	6	4	(00)	22284.4200	–17.6	–4
10	7	3	9	7	2	(00)	22214.2012	–29.4	–8
10	7	4	9	7	3	(00)	22214.1521	–26.4	–5
11	0	11	10	0	10	(00)	20903.6217	–9.6	2
11	0	11	10	1	10	(00)	20888.8398	–13.2	1
11	1	10	10	1	9	(00)	22820.9622	24.6	–1
11	1	11	10	0	10	(00)	20910.6536	–8.2	2
11	1	11	10	1	10	(00)	20895.8725	–11	2
11	2	9	10	2	8	(00)	25033.5778	31.6	–2
11	2	10	10	1	9	(00)	23043.3264	55.3	–3
11	2	10	10	2	9	(00)	22638.7500	7.0	–1
12	0	12	11	0	11	(00)	22719.1937	–26.7	2
12	0	12	11	1	11	(00)	22712.1618	–28.1	2
12	1	11	11	1	10	(00)	24591.8735	–2.0	–3
12	1	12	11	0	11	(00)	22722.4942	–25.6	2
12	1	12	11	1	11	(00)	22715.4618	–27.5	2
2	0	2	1	0	1	(10)	4332.5698	5.1	–1
2	1	1	1	1	0	(10)	4756.9004	–57.4	–2
2	1	2	1	0	1	(10)	5775.6664	–13.9	0
2	1	2	1	1	1	(10)	4016.3401	69.9	–9
2	2	0	1	1	0	(10)	10190.6585	612.3	6
2	2	0	1	1	1	(10)	10581.0515	802.6	–10
2	2	1	1	1	0	(10)	9970.2232	–822.0	–2
2	2	1	1	1	1	(10)	10360.6373	–610.6	3
3	0	3	2	0	2	(10)	6371.9793	13.7	–1
3	1	2	2	1	1	(10)	7104.8527	–7.7	0
3	1	3	2	0	2	(10)	7430.0368	16.0	1
3	1	3	2	1	2	(10)	5986.9404	35.3	0
3	2	1	2	1	1	(10)	12175.3318	415.4	–2
3	2	1	2	1	2	(10)	13306.2956	488.9	–1

3	2	1	2	2	0	(10)	6741.5820	–246.0	–2
3	2	2	2	1	1	(10)	11839.3041	–494.3	–1
3	2	2	2	1	2	(10)	12970.2648	–423.9	–3
3	2	2	2	2	1	(10)	6625.9786	267.5	–4
3	3	0	3	2	1	(10)	9666.0707	505.4	–6
3	3	1	3	2	2	(10)	9680.9347	–747.4	–5
4	0	4	3	0	3	(10)	8291.9296	23.4	1
4	1	3	3	1	2	(10)	9399.3798	–1.8	1
4	1	4	3	0	3	(10)	8987.1593	31.1	1
4	1	4	3	1	3	(10)	7929.1028	29.7	0
4	2	2	3	1	3	(10)	16508.3944	201.8	0
4	2	2	3	2	1	(10)	9189.0401	–250.9	2
4	2	3	3	1	2	(10)	13488.9417	–206	–3
4	2	3	3	2	2	(10)	8754.4925	282.9	1
4	3	1	3	3	0	(10)	8881.8321	8.7	5
4	3	1	4	2	2	(10)	9358.8611	763.5	–4
4	3	1	4	2	3	(10)	10129.4410	1144	1
4	3	2	3	3	1	(10)	8881.7445	28.9	7
4	3	2	4	2	3	(10)	9808.1873	–1000.8	1
4	4	0	4	3	1	(10)	13631.5365	–17.6	6
4	4	1	4	3	2	(10)	13524.7096	–681.2	–2
5	0	5	4	0	4	(10)	10118.7934	32.1	3
5	0	5	4	1	4	(10)	9423.5621	22.9	1
5	1	4	4	1	3	(10)	11615.8258	–3.9	–2
5	1	4	4	2	3	(10)	7526.2626	198.9	1
5	1	5	4	0	4	(10)	10534.2403	40.7	3
5	1	5	4	1	4	(10)	9839.0091	31.5	1
5	2	3	4	2	2	(10)	11684.7212	–93.5	3
5	2	4	4	1	3	(10)	14944.7760	–82.2	–1
5	2	4	4	2	2	(10)	10084.6322	–260.6	–4
5	2	4	4	2	3	(10)	10855.2143	122.1	3
5	2	4	5	1	5	(10)	8824.9174	–117.3	–3
5	3	2	4	3	1	(10)	11164.9415	–74.5	0
5	3	2	4	3	2	(10)	11486.1987	2073.7	3
5	3	2	5	2	3	(10)	8839.0842	785.2	–4
5	3	2	5	2	4	(10)	10439.1712	950.3	1
5	3	3	4	3	2	(10)	11143.7922	97.4	2
5	3	3	5	2	4	(10)	10096.7614	–1029.3	–3
5	4	1	4	4	0	(10)	11086.2124	8.0	1
5	4	1	5	3	2	(10)	13552.8010	58.5	1
5	4	2	4	4	1	(10)	11087.4915	10.9	2

5	4	2	5	3	3	(10)	13468.4077	–768.9	–3
5	5	0	5	4	1	(10)	17528.6994	–492.3	5
5	5	1	5	4	2	(10)	17420.8012	–1059.3	2
6	0	6	5	0	5	(10)	11904.2636	33.5	0
6	0	6	5	1	5	(10)	11488.8179	26.2	1
6	1	5	5	1	4	(10)	13723.5212	–3.1	–2
6	1	5	5	2	4	(10)	10394.5723	76.5	–1
6	1	6	5	0	5	(10)	12135.1005	38.4	–2
6	1	6	5	1	5	(10)	11719.6555	31.8	0
6	2	4	5	2	3	(10)	14161.4911	–45.4	1
6	2	5	5	1	4	(10)	16253.5751	–27.0	–2
6	2	5	5	2	4	(10)	12924.6296	56.0	3
6	2	5	6	0	6	(10)	10260.7274	–89.2	–3
6	2	5	6	1	6	(10)	10029.8902	–94.4	–1
6	3	3	5	3	2	(10)	13535.3035	–315.6	1
6	3	3	6	2	4	(10)	8212.8950	513.4	–6
6	3	3	6	2	5	(10)	11049.8436	577.2	–2
6	3	4	5	3	2	(10)	13046.7746	–1652.4	0
6	3	4	5	3	3	(10)	13389.1805	323.4	0
6	3	4	6	1	5	(10)	13091.3667	–785.4	–5
6	3	4	6	2	5	(10)	10561.3153	–759	–3
6	4	2	5	4	1	(10)	13343.5758	–1.8	1
6	4	2	6	3	3	(10)	13361.0733	372.4	1
6	4	3	5	4	2	(10)	13345.4533	4.2	–1
6	4	3	6	3	4	(10)	13424.6828	–1085.8	–2
6	5	1	5	5	0	(10)	13294.4786	–1.9	–1
6	5	1	6	4	2	(10)	17479.6088	–485.8	10
6	5	2	5	5	1	(10)	13295.6839	2.9	6
6	5	2	6	4	3	(10)	17371.0242	–1068.2	2
7	0	7	6	0	6	(10)	13686.2957	39.5	5
7	0	7	6	1	6	(10)	13455.4538	29.6	2
7	1	6	6	1	5	(10)	15700.0313	0.4	0
7	1	6	6	2	5	(10)	13169.9782	25.2	1
7	1	6	7	0	7	(10)	9744.4152	–98.3	–2
7	1	6	7	1	7	(10)	9622.6787	–103.1	–1
7	1	7	6	0	6	(10)	13808.0283	40.4	1
7	1	7	6	1	6	(10)	13577.1889	33.0	0
7	2	5	6	2	4	(10)	16573.2713	–44.1	0
7	2	6	6	1	5	(10)	17481.0492	3.6	2
7	2	6	6	2	5	(10)	14950.9936	25.9	0
7	2	6	7	0	7	(10)	11525.4300	–98.2	–3

7	2	6	7	1	7	(10)	11403.6925	–104.0	–4
7	3	4	6	3	3	(10)	16026.7270	–345.2	2
7	3	4	7	2	5	(10)	7666.3516	213.1	–3
7	3	5	6	3	4	(10)	15586.3481	330.2	1
7	3	5	7	1	6	(10)	12977.6885	–450.6	1
7	3	5	7	2	6	(10)	11196.6680	–456.4	–4
7	4	3	6	4	2	(10)	15625.3749	–29.4	0
7	4	3	7	3	4	(10)	12959.7208	687.8	–1
7	4	4	6	4	3	(10)	15625.2326	9.5	1
7	4	4	7	3	4	(10)	12534.6598	–2067.6	–4
7	5	2	6	5	1	(10)	15544.4971	–15.6	–2
7	5	2	7	4	3	(10)	17398.7327	–470.3	10
7	5	3	6	5	2	(10)	15546.2983	–15.3	–1
7	5	3	7	4	4	(10)	17292.0926	–1090.2	3
7	6	1	6	6	0	(10)	15503.9428	–17.3	–2
8	0	8	7	0	7	(10)	15478.3367	34.4	1
8	0	8	7	1	7	(10)	15356.6001	29.5	1
8	1	7	7	1	6	(10)	17552.2546	–0.1	0
8	1	7	7	2	6	(10)	15771.2388	–1.2	0
8	1	7	8	0	8	(10)	11818.3325	–133.4	–3
8	1	7	8	1	8	(10)	11756.4897	–135.8	–2
8	1	8	7	0	7	(10)	15540.1804	37.7	0
8	1	8	7	1	7	(10)	15418.4436	32.6	0
8	2	6	7	2	5	(10)	18888.0211	–59.2	–1
8	2	6	7	3	5	(10)	12150.5809	392.6	8
8	2	7	7	1	6	(10)	18712.3239	11.1	0
8	2	7	7	2	6	(10)	16931.3078	9.7	0
8	2	7	8	0	8	(10)	12978.4037	–120.2	–1
8	2	7	8	1	8	(10)	12916.5570	–126.6	–4
8	3	5	7	3	4	(10)	18590.8646	–201.9	2
8	3	5	8	2	6	(10)	7369.1969	72.2	2
8	3	6	7	3	5	(10)	17755.2208	148.8	0
8	3	6	8	2	7	(10)	12020.5820	–316.3	–3
8	4	4	7	4	3	(10)	17946.1232	–127	0
8	4	4	8	3	5	(10)	12314.9821	765.4	–1
8	4	5	7	4	4	(10)	17923.2271	71.3	0
8	5	3	8	4	4	(10)	17263.4237	–377.4	9
8	5	4	7	5	3	(10)	17813.3874	–30.2	–1
8	5	4	8	4	5	(10)	17182.2516	–1193	0
8	6	2	7	6	1	(10)	17749.7231	–35.2	–2
8	6	3	7	6	2	(10)	17751.3944	–41.9	–3

8	7	1	7	7	0	(10)	17713.9930	–35.1	3
8	7	2	7	7	1	(10)	17715.2528	–47.8	1
9	0	9	8	0	8	(10)	17280.5792	31.5	1
9	1	8	8	1	7	(10)	19323.3152	–4.5	0
9	1	8	8	2	7	(10)	18163.2446	–17.0	0
9	1	9	8	0	8	(10)	17311.1405	33.0	0
9	1	9	8	1	8	(10)	17249.2971	29.9	0
9	2	7	8	2	6	(10)	21080.3818	–76.9	–2
9	2	8	8	1	7	(10)	20028.0693	8.0	–1
9	2	8	8	2	7	(10)	18867.9998	–3.5	–1
9	3	6	8	3	5	(10)	21166.6261	–143.2	0
9	3	6	9	2	7	(10)	7455.4400	4.7	3
9	3	7	8	3	6	(10)	19892.4667	35.7	0
9	3	7	9	2	8	(10)	13045.0501	–275.9	0
9	4	5	8	4	4	(10)	20344.1502	–376.2	0
9	4	5	9	3	6	(10)	11492.5029	529.1	–5
9	4	6	8	4	5	(10)	20212.9066	272.4	0
9	5	4	8	5	3	(10)	20096.5797	–63.3	–2
9	5	4	9	4	5	(10)	17015.8521	–65.6	6
9	5	5	8	5	4	(10)	20099.7962	–50.2	–2
9	6	3	8	6	2	(10)	20008.1164	–61.1	–3
9	6	4	8	6	3	(10)	20010.3839	–65.6	–4
9	7	2	8	7	1	(10)	19956.9661	–66.1	–4
9	7	3	8	7	2	(10)	19958.6194	–76.2	–3
9	8	1	8	8	0	(10)	19924.3519	–74.8	–6
9	8	2	8	8	1	(10)	19925.7073	–91.6	–7
10	0	10	9	0	9	(10)	19089.7986	26.1	1
10	0	10	9	1	9	(10)	19059.2366	24.0	1
10	1	9	9	1	8	(10)	21067.3601	–15.5	–1
10	1	10	9	0	9	(10)	19104.5857	27.6	1
10	1	10	9	1	9	(10)	19074.0232	24.9	0
10	2	8	9	2	7	(10)	23129.2390	–93.8	–2
10	2	8	10	1	9	(10)	11394.9541	–214.8	–1
10	2	8	10	2	9	(10)	10990.3287	–225.4	1
10	2	9	9	1	8	(10)	21471.9876	–2.7	–1
10	2	9	9	2	8	(10)	20767.2320	–16.6	–1
10	3	7	9	3	6	(10)	23692.2733	–148.7	0
10	3	7	10	2	8	(10)	8018.4751	–49.4	6
10	3	8	9	3	7	(10)	21984.9012	–29.1	–1
10	3	8	10	2	9	(10)	14262.7174	–290.3	–2
10	4	6	9	4	5	(10)	22857.4972	–500.1	0

10	4	6	10	3	7	(10)	10657.7257	176.6	–5
10	4	7	9	4	6	(10)	22462.7889	331.7	–1
10	5	5	9	5	4	(10)	22406.6924	–107.8	–1
10	5	6	9	5	5	(10)	22407.8992	–65.8	–2
10	6	4	9	6	3	(10)	22280.9952	–93.9	–4
10	6	5	9	6	4	(10)	22284.0071	–94.5	–4
10	7	3	9	7	2	(10)	22210.2346	–98.8	–6
10	7	4	9	7	3	(10)	22212.3642	–109.2	–6
11	0	11	10	0	10	(10)	20903.1257	17.8	0
11	0	11	10	1	10	(10)	20888.3393	17.1	1
11	1	10	10	1	9	(10)	22819.3593	–29.3	–2
11	1	11	10	0	10	(10)	20910.1613	18.6	0
11	1	11	10	1	10	(10)	20895.3747	17.7	1
11	2	9	10	2	8	(10)	25030.1003	–112.6	–3
11	2	10	10	1	9	(10)	23041.7838	–19.8	–2
11	2	10	10	2	9	(10)	22637.1569	–31.9	–2
11	4	7	11	3	8	(10)	10002.8745	–27.7	–2
12	0	12	11	0	11	(10)	22718.7034	7.7	1
12	0	12	11	1	11	(10)	22711.6682	7.3	2
12	1	11	11	1	10	(10)	24590.2712	–46.3	–2
12	1	12	11	0	11	(10)	22722.0062	8.8	2
12	1	12	11	1	11	(10)	22714.9695	6.8	1
2	0	2	1	0	1	(01)	4036.8715	–525	4
2	1	1	1	1	1	(01)	4493.1677	–7.3	0
2	1	2	1	0	1	(01)	5005.8439	–437.9	3
2	2	0	1	1	0	(01)	15622.8461	1262.8	7
2	2	0	2	2	1	(01)	11195.9530	1249.2	7
2	2	1	1	1	1	(01)	11778.1065	1207	–3
2	2	1	2	1	1	(01)	7284.9387	1214.3	–2
3	0	3	2	0	2	(01)	6249.3910	–146.1	0
3	1	2	2	1	1	(01)	6738.6138	–383.5	2
3	1	2	2	1	2	(01)	9754.2144	1213.9	1
3	1	3	2	0	2	(01)	7232.2409	117.1	0
3	1	3	2	1	2	(01)	6263.2583	19.7	–9
3	2	1	2	2	1	(01)	6673.0470	12.3	–1
3	2	2	2	0	2	(01)	11970.0523	–701.7	22
3	2	2	2	1	2	(01)	11001.0623	–806.5	5
3	3	1	2	2	0	(01)	6636.5400	14.0	0
3	3	1	3	2	1	(01)	11159.4442	1249.1	6
4	0	4	3	0	3	(01)	8283.6631	–7.9	–1
4	1	3	3	1	2	(01)	8897.1159	–646.5	4

4	1	3	3	1	3	(01)	12388.0551	530.7	–3
4	1	4	3	0	3	(01)	9041.7651	227.2	–5
4	1	4	3	1	3	(01)	8058.9190	–32.2	–1
4	2	2	3	2	1	(01)	8961.2555	–10.9	–1
4	2	3	3	1	2	(01)	10516.1858	–1462.6	3
4	2	3	3	2	2	(01)	9269.3293	549.1	–10
4	3	1	3	3	1	(01)	8874.4079	13.8	–1
4	3	1	4	2	2	(01)	11072.5945	1271.8	5
4	3	2	4	2	3	(01)	7560.0322	–1420.9	–3
4	4	1	4	3	1	(01)	15018.9533	1357.9	7
5	0	5	4	0	4	(01)	10166.5590	56.8	–3
5	0	5	4	1	4	(01)	9408.4573	–178	0
5	1	4	4	1	3	(01)	11126.8437	–457.2	1
5	1	5	4	0	4	(01)	10655.5298	202.5	–4
5	1	5	4	1	4	(01)	9897.4283	–32.1	0
5	2	3	4	2	2	(01)	11289.9594	–146.4	1
5	2	4	4	1	3	(01)	13079.3795	–524.6	1
5	2	4	4	2	3	(01)	11460.3052	287.1	–3
5	2	4	5	1	5	(01)	7511.0947	77.9	6
5	3	2	4	3	1	(01)	11135.4581	12.3	1
5	3	2	5	2	3	(01)	10918.0933	1430.6	5
5	3	3	4	3	2	(01)	11275.9631	201.1	0
5	3	3	5	2	4	(01)	7375.6899	–1507.1	0
5	4	1	4	4	1	(01)	11081.3902	17.1	0
5	4	1	5	3	2	(01)	14964.8874	1364.7	9
5	4	2	5	3	3	(01)	11740.6113	–459.7	–8
5	5	1	4	4	0	(01)	11057.1007	21.1	0
6	0	6	5	0	5	(01)	11957.5582	57.0	–3
6	0	6	5	1	5	(01)	11468.5889	–87.2	–1
6	1	5	5	1	4	(01)	13388.4191	–212.1	–2
6	1	5	5	2	4	(01)	11435.8828	–145.3	–2
6	1	6	5	0	5	(01)	12237.9932	121.0	–3
6	1	6	5	1	5	(01)	11749.0228	–24.3	–2
6	2	4	5	2	3	(01)	13599.2245	–508.0	1
6	2	4	5	3	3	(01)	11717.6261	3623	–10
6	2	5	5	1	4	(01)	15366.5396	21.2	–3
6	2	5	5	2	4	(01)	13414.0047	89.5	–1
6	2	5	6	1	6	(01)	9176.0696	184.6	–1
6	3	3	5	3	2	(01)	13428.0360	–2.5	–2
6	3	3	6	2	4	(01)	10746.9053	1936.7	2
6	3	4	5	3	3	(01)	13720.0752	485.9	–4

6	3	4	6	2	5	(01)	7681.7609	–1110.2	–1
6	4	2	5	4	1	(01)	13331.9696	14.1	–2
6	4	2	6	3	3	(01)	14868.8207	1381	8
6	4	3	5	4	2	(01)	13400.8003	38.0	0
6	4	3	6	3	4	(01)	11421.3363	–907.7	–4
6	5	1	5	5	1	(01)	13290.3455	24.6	1
6	5	1	6	4	2	(01)	18827.9305	1634.2	–14
7	0	7	6	0	6	(01)	13726.1399	28.9	–2
7	0	7	6	1	6	(01)	13445.7054	–34.6	–1
7	1	6	6	1	5	(01)	15554.4749	–4.8	–1
7	1	6	6	2	5	(01)	13576.3559	–236.6	2
7	1	6	7	0	7	(01)	9306.7180	–19.5	0
7	1	7	6	0	6	(01)	13875.6188	46.7	–2
7	1	7	6	1	6	(01)	13595.1839	–17.3	–2
7	2	5	6	2	4	(01)	15846.1848	–774.0	3
7	2	6	6	1	5	(01)	17238.2364	262.3	–3
7	2	6	6	2	5	(01)	15260.1168	29.8	–1
7	2	6	7	0	7	(01)	10990.4793	247.4	–2
7	2	6	7	1	7	(01)	10841.0015	230.7	–1
7	3	4	6	3	3	(01)	15761.4873	–43.9	–1
7	3	4	7	2	5	(01)	10662.2088	2667.7	–1
7	3	5	6	3	4	(01)	16206.4158	626.4	–5
7	3	5	7	2	6	(01)	8628.0601	–513.4	–4
7	4	3	6	4	2	(01)	15602.2568	11.4	–1
7	4	3	7	3	4	(01)	14709.5899	1436	8
7	4	4	6	4	3	(01)	15720.2781	74.6	0
7	4	4	7	3	5	(01)	10935.1956	–1462.5	–2
7	5	2	6	5	1	(01)	15535.6803	25.5	0
7	5	2	7	4	3	(01)	18761.3548	1649.1	–12
7	5	3	6	5	2	(01)	15584.9521	–3.5	1
7	5	3	7	4	4	(01)	15581.9214	–22.7	–2
7	6	1	6	6	1	(01)	15500.2014	40.9	2
8	0	8	7	0	7	(01)	15504.9212	2.1	–2
8	0	8	7	1	7	(01)	15355.4425	–15.4	–2
8	1	7	7	1	6	(01)	17552.5631	130.0	–2
8	1	7	7	2	6	(01)	15868.8011	–137.6	0
8	1	7	8	0	8	(01)	11354.3604	108.9	1
8	1	8	7	0	7	(01)	15580.9988	0.3	–2
8	1	8	7	1	7	(01)	15431.5202	–17.2	–2
8	2	6	7	2	5	(01)	18117.7315	–631.5	2
8	2	7	7	1	6	(01)	18784.4023	304.5	–3

8	2	7	7	2	6	(01)	17100.6406	37.3	–1
8	2	7	8	0	8	(01)	12586.1992	283.1	–1
8	2	7	8	1	8	(01)	12510.1225	285.8	1
8	3	5	7	3	4	(01)	18134.2087	–186.1	0
8	3	5	8	2	6	(01)	10678.6860	3113.2	–3
8	3	6	7	3	5	(01)	18536.6552	410.4	–2
8	3	6	8	1	7	(01)	11295.9177	38.1	–3
8	3	6	8	2	7	(01)	10064.0755	–139.5	–5
8	4	4	7	4	3	(01)	17897.1329	1.9	0
8	4	4	8	3	5	(01)	14472.5143	1624.1	9
8	4	5	7	4	4	(01)	18101.9306	177.9	–2
8	5	3	7	5	2	(01)	17795.4098	25.1	0
8	5	3	8	4	4	(01)	18659.6323	1672.9	–11
8	5	4	7	5	3	(01)	17870.3063	–5.5	0
8	5	4	8	4	5	(01)	15350.2983	–204.9	1
8	6	2	7	6	1	(01)	17742.3753	45.8	2
8	6	3	7	6	2	(01)	17782.4733	–40.0	1
8	7	1	7	7	1	(01)	17710.5208	71.3	4
9	0	9	8	0	8	(01)	17298.1908	–17.1	–2
9	0	9	8	1	8	(01)	17222.1130	–15.4	–2
9	1	8	8	1	7	(01)	19391.3445	177.7	–1
9	1	8	8	2	7	(01)	18159.5050	2.9	–1
9	1	9	8	0	8	(01)	17335.7220	–24.1	–2
9	1	9	8	1	8	(01)	17259.6442	–22.5	–2
9	2	7	8	2	6	(01)	20446.7697	–331.6	0
9	2	8	8	1	7	(01)	20189.1925	236.3	–1
9	2	8	8	2	7	(01)	18957.3530	61.5	–1
9	3	6	9	2	7	(01)	10737.5671	2931.9	–2
9	3	7	8	4	5	(01)	10113.1790	1882	1
9	3	7	9	1	8	(01)	12518.2222	46.4	–4
9	4	5	8	4	4	(01)	20223.1492	–20.0	0
9	4	5	9	3	6	(01)	14190.0124	2116.7	8
9	4	6	9	3	7	(01)	10464.9905	–1478.8	–3
9	5	4	8	5	3	(01)	20072.1413	22.7	1
9	5	4	9	4	5	(01)	18508.6244	1715.6	–10
9	5	5	8	5	4	(01)	20183.0584	–2.6	1
9	6	3	8	6	2	(01)	19995.9222	51.2	2
9	6	4	8	6	3	(01)	20053.3814	–51.5	1
9	7	2	8	7	1	(01)	19950.5765	83.2	4
9	7	3	8	7	2	(01)	19985.3844	–80.3	2
9	8	1	8	8	1	(01)	19921.0859	125.7	5

10	0	10	9	0	9	(01)	19101.8513	–31.4	–2
10	0	10	9	1	9	(01)	19064.3203	–24.2	–2
10	1	10	9	0	9	(01)	19119.9520	–38.5	–2
10	1	10	9	1	9	(01)	19082.4206	–31.7	–2
10	2	8	10	1	9	(01)	11165.4536	8.8	–4
10	3	7	10	2	8	(01)	10819.2923	2134.2	–1
10	4	6	10	3	7	(01)	13958.3991	2886.5	6
10	4	7	10	3	8	(01)	11082.3083	–1010.3	–7
11	2	9	11	2	10	(01)	12903.9358	89.3	–11
2	0	2	1	0	1	(11)	4030.2113	–30.8	3
2	2	0	2	2	1	(11)	11133.4091	–207.9	7
2	2	1	2	1	1	(11)	7218.5171	–133.8	–1
3	0	3	2	0	2	(11)	6240.9617	–1.0	0
3	1	2	2	1	1	(11)	6751.7004	–28.2	1
3	1	2	2	1	2	(11)	9672.4972	–75.6	–8
3	1	3	2	0	2	(11)	7274.0238	–2.2	0
3	1	3	2	1	2	(11)	6246.5795	–41.0	0
3	2	2	2	0	2	(11)	12089.3519	41.1	–3
3	2	2	2	1	2	(11)	11061.9139	8.7	3
3	3	1	3	2	1	(11)	11094.6673	–211.6	6
4	0	4	3	0	3	(11)	8280.9653	14.3	–1
4	1	3	3	1	2	(11)	8902.3401	–38.3	3
4	1	3	3	1	3	(11)	12328.2582	–72.5	–5
4	1	4	3	0	3	(11)	9077.4079	–33.3	–2
4	1	4	3	1	3	(11)	8044.3469	–31.0	–1
4	2	2	3	2	1	(11)	8967.5015	–20.4	–2
4	2	3	3	1	2	(11)	10647.1923	42.1	5
4	2	3	3	2	2	(11)	9257.7767	–41.0	–5
4	3	1	3	3	1	(11)	8875.5515	–21.9	–1
4	3	1	4	2	2	(11)	11002.7201	–210.3	9
4	3	2	4	2	3	(11)	7625.1721	77.4	1
4	4	1	4	3	1	(11)	14953.3922	–217.7	6
5	0	5	4	0	4	(11)	10169.1042	10.5	–2
5	0	5	4	1	4	(11)	9372.6618	58.3	–1
5	1	4	4	1	3	(11)	11118.8947	–6.6	–2
5	1	5	4	0	4	(11)	10684.0839	–61.7	–2
5	1	5	4	1	4	(11)	9887.6405	–14.9	–2
5	2	3	4	2	2	(11)	11302.3192	–35.7	–2
5	2	4	4	1	3	(11)	13187.4573	0.3	1
5	2	4	4	2	3	(11)	11442.6012	–84.0	–4
5	2	4	5	1	5	(11)	7583.7268	–27.6	–2

5	3	2	4	3	1	(11)	11137.6404	–28.0	0
5	3	2	5	2	3	(11)	10838.0364	–207.5	5
5	3	3	4	3	2	(11)	11274.3087	–42.0	–1
5	3	3	5	2	4	(11)	7456.8727	112.5	–2
5	4	1	4	4	1	(11)	11081.7131	–28.1	–1
5	4	1	5	3	2	(11)	14897.4672	–215.4	7
5	4	2	5	3	3	(11)	11788.7492	171.2	–12
5	5	1	4	4	0	(11)	11056.7834	–26.3	–2
6	0	6	5	0	5	(11)	11961.8219	–3.4	–3
6	0	6	5	1	5	(11)	11446.8250	51.5	–20
6	1	5	5	1	4	(11)	13376.8741	42.3	–2
6	1	5	5	2	4	(11)	11308.3155	39.4	–1
6	1	6	5	0	5	(11)	12257.9357	–76.1	–2
6	1	6	5	1	5	(11)	11742.9563	–3.6	–1
6	2	4	5	2	3	(11)	13616.7654	–52.1	0
6	2	4	5	3	3	(11)	11482.5822	–296.8	–4
6	2	5	5	1	4	(11)	15458.1553	–80.3	–1
6	2	5	5	2	4	(11)	13389.6008	–79.1	4
6	2	5	6	1	6	(11)	9230.3665	–108.0	–1
6	3	3	5	3	2	(11)	13432.1496	–39.3	–2
6	3	3	6	2	4	(11)	10653.4193	–196	2
6	3	4	5	3	3	(11)	13712.1864	–78.5	–4
6	3	4	6	2	5	(11)	7779.4645	119.3	–3
6	4	2	5	4	1	(11)	13332.7233	–36.8	–3
6	4	2	6	3	3	(11)	14798.0428	–211.1	8
6	4	3	5	4	2	(11)	13399.8569	–61.9	0
6	4	3	6	3	4	(11)	11476.4205	188.6	–7
6	5	1	5	5	1	(11)	13290.1197	–30.8	–1
6	5	1	6	4	2	(11)	18759.9463	–33.2	–12
6	5	2	6	4	3	(11)	15762.3567	291.2	–10
7	0	7	6	0	6	(11)	13729.5214	–13.1	–2
7	0	7	6	1	6	(11)	13433.4085	60.4	–2
7	1	6	6	1	5	(11)	15547.8710	70.5	–3
7	1	6	6	2	5	(11)	13466.5910	194.3	–2
7	1	6	7	0	7	(11)	9263.5499	26.7	–1
7	1	7	6	0	6	(11)	13887.6499	–72.7	–1
7	1	7	6	1	6	(11)	13591.5369	0.7	–2
7	2	5	6	2	4	(11)	15858.3828	–30.0	2
7	2	6	6	1	5	(11)	17316.7160	–162.8	5
7	2	6	6	2	5	(11)	15235.4293	–45.7	–1
7	2	6	7	0	7	(11)	11032.3915	–210.0	4

7	2	6	7	1	7	(11)	10874.2598	–153.5	0
7	3	4	6	3	3	(11)	15769.2618	–56.7	–3
7	3	4	7	2	5	(11)	10564.2991	–221.8	–2
7	3	5	6	3	4	(11)	16190.0867	–143.9	–3
7	3	5	7	2	6	(11)	8734.1225	21.8	–5
7	4	3	6	4	2	(11)	15603.7157	–44.4	–2
7	4	3	7	3	4	(11)	14632.4952	–200.4	7
7	4	4	6	4	3	(11)	15718.6593	–84.6	1
7	4	4	7	3	5	(11)	11004.9955	250.4	0
7	5	2	6	5	1	(11)	15535.6447	–35.5	0
7	5	2	7	4	3	(11)	18691.8736	–26.0	–12
7	5	3	6	5	2	(11)	15583.3577	–86.1	2
7	5	3	7	4	4	(11)	15627.0597	294.2	–5
7	6	1	6	6	1	(11)	15499.5538	–26.7	0
8	0	8	7	0	7	(11)	15506.8921	–16.8	–2
8	0	8	7	1	7	(11)	15348.7633	42.6	–2
8	1	7	7	1	6	(11)	17553.8674	65.1	–2
8	1	7	7	2	6	(11)	15785.0282	304.2	–4
8	1	7	8	0	8	(11)	11310.5246	108.0	–2
8	1	7	8	1	8	(11)	11229.9421	149.5	–3
8	1	8	7	0	7	(11)	15587.4735	–59.4	–1
8	1	8	7	1	7	(11)	15429.3449	0.2	–2
8	2	6	7	2	5	(11)	18114.7919	38	1
8	2	7	7	1	6	(11)	18849.9823	–239.2	2
8	2	7	7	2	6	(11)	17081.1437	0.5	0
8	2	7	8	0	8	(11)	12606.6395	–196.3	2
8	2	7	8	1	8	(11)	12526.0583	–153.5	2
8	3	5	7	3	4	(11)	18148.1383	–80.5	–2
8	3	5	8	2	6	(11)	10597.6454	–340.3	–5
8	3	6	7	3	5	(11)	18513.1185	–185.5	–1
8	3	6	8	1	7	(11)	11462.2106	–470.2	–4
8	3	6	8	2	7	(11)	10166.0975	–164.1	–6
8	4	4	7	4	3	(11)	17899.7478	–57.1	–2
8	4	4	8	3	5	(11)	14384.1053	–176.4	8
8	4	5	7	4	4	(11)	18098.3003	–125.3	0
8	5	3	7	5	2	(11)	17795.6908	–43.3	–2
8	5	3	8	4	4	(11)	18587.8142	–14.5	–14
8	5	4	7	5	3	(11)	17868.2721	–110.7	2
8	5	4	8	4	5	(11)	15397.0447	322	10
8	6	2	7	6	1	(11)	17741.7928	–29.3	–1
8	6	3	7	6	2	(11)	17780.3534	–115.5	5

8	7	1	7	7	1	(11)	17709.5255	–9.3	1
9	0	9	8	0	8	(11)	17299.1063	–17.9	–2
9	0	9	8	1	8	(11)	17218.5250	24.8	–2
9	1	8	8	1	7	(11)	19398.1764	33.8	–1
9	1	9	8	0	8	(11)	17338.8955	–45.2	–1
9	1	9	8	1	8	(11)	17258.3140	–2.7	–1
9	2	7	8	2	6	(11)	20433.5486	120.1	–2
9	2	8	8	1	7	(11)	20239.8465	–268.8	3
9	2	8	8	2	7	(11)	18943.7316	35.5	0
9	3	6	8	3	5	(11)	20526.2233	–88.9	0
9	3	6	9	2	7	(11)	10690.3184	–551.1	–4
9	3	7	8	3	6	(11)	20582.3820	–150	2
9	3	7	9	1	8	(11)	12646.4173	–652.9	0
9	3	7	9	2	8	(11)	11804.7482	–349.3	–4
9	4	5	8	4	4	(11)	20227.7420	–75.6	–2
9	4	5	9	3	6	(11)	14085.6236	–163.5	5
9	4	6	8	4	5	(11)	20568.8215	–205.8	–1
9	5	4	8	5	3	(11)	20072.9175	–51.2	–1
9	5	4	9	4	5	(11)	18432.9901	10.3	–13
9	5	5	8	5	4	(11)	20180.4949	–143.6	3
9	5	5	9	4	6	(11)	15008.7026	368.7	–2
9	6	3	8	6	2	(11)	19995.4782	–31.2	–1
9	6	4	8	6	3	(11)	20050.8178	–144.7	5
9	7	2	8	7	1	(11)	19949.5737	–5.8	1
9	7	3	8	7	2	(11)	19982.8044	–156.5	6
9	8	1	8	8	1	(11)	19919.7922	31.2	2
10	0	10	9	0	9	(11)	19102.1342	–18	–1
10	0	10	9	1	9	(11)	19062.3449	9.2	–2
10	1	9	9	1	8	(11)	21149.9120	9	1
10	1	10	9	0	9	(11)	19121.3364	–35.7	–1
10	1	10	9	1	9	(11)	19081.5480	–7.6	–1
10	2	8	9	2	7	(11)	22725.5075	176	–3
10	2	8	10	1	9	(11)	11113.5388	–102.7	–6
10	2	9	9	1	8	(11)	21649.6977	–243.9	5
10	2	9	9	2	8	(11)	20808.0271	58.2	0
10	3	7	9	3	6	(11)	22839.4135	–32.4	1
10	3	7	10	2	8	(11)	10804.2242	–759.7	0
10	3	8	9	3	7	(11)	22476.0334	–56.1	3
10	4	6	9	4	5	(11)	22596.1620	–106.7	–3
10	4	6	10	3	7	(11)	13842.3728	–237.1	2
10	4	7	9	4	6	(11)	23109.0971	–326.3	–2

10	4	7	10	3	8	(11)	11209.6784	–17.5	–9
10	5	5	9	5	4	(11)	22370.5473	–63.9	–2
10	5	6	9	5	5	(11)	22529.6143	–172.5	21
10	6	4	9	6	3	(11)	22262.2899	–49.2	–16
10	6	5	9	6	4	(11)	22339.4428	–180.7	5
11	0	11	10	0	10	(11)	20911.6578	–20.7	–1
11	0	11	10	1	10	(11)	20892.4554	–3.2	–1
11	1	11	10	0	10	(11)	20920.7650	–30.5	–1
11	1	11	10	1	10	(11)	20901.5626	–13	–1
11	2	9	10	2	8	(11)	24875.5027	176	–2
11	2	10	10	1	9	(11)	23162.2892	–180.7	6
11	2	10	10	2	9	(11)	22662.5033	72.1	1
12	0	12	11	0	11	(11)	22724.8226	–21.6	2
12	0	12	11	1	11	(11)	22715.7077	–19.5	–6
12	1	11	11	1	10	(11)	24633.9727	22.4	4
12	1	12	11	0	11	(11)	22729.0774	–31.7	–2
12	1	12	11	1	11	(11)	22719.9691	–23	–4
2	0	2	1	0	1	(12)	4045.2186	139	3
2	1	2	1	0	1	(12)	4954.8825	451.2	4
2	2	0	2	2	1	(12)	11239.5747	–1355.8	7
2	2	1	1	1	1	(12)	11820.9796	–1064.7	0
2	2	1	2	1	1	(12)	7336.3656	–1119.4	2
3	0	3	2	0	2	(12)	6257.4435	22.1	0
3	1	2	2	1	1	(12)	6725.5077	216.9	2
3	1	2	2	1	2	(12)	9824.9864	–982.2	–8
3	1	3	2	0	2	(12)	7187.4211	168.3	–1
3	1	3	2	1	2	(12)	6277.7581	–143	–1
3	2	1	3	1	3	(12)	10826.7997	–2149.5	–5
3	2	2	2	0	2	(12)	11850.1845	936.5	4
3	2	2	2	1	2	(12)	10940.5207	624.4	3
3	3	1	3	2	1	(12)	11205.2103	–1368.3	7
4	0	4	3	0	3	(12)	8284.8980	16.5	–1
4	1	3	3	1	2	(12)	8892.6781	265	3
4	1	3	3	1	3	(12)	12439.9054	–575.1	–5
4	1	4	3	0	3	(12)	9002.2985	40.7	–3
4	1	4	3	1	3	(12)	8072.3210	–105.3	–2
4	2	2	3	2	1	(12)	8953.1537	53.7	–1
4	2	2	4	1	4	(12)	11707.6249	–1998	–11
4	2	3	3	1	2	(12)	10390.6645	1319.8	7
4	2	3	3	1	3	(12)	13937.8949	482.7	2
4	2	3	3	2	2	(12)	9275.1308	–286.2	–3

4	3	1	3	3	1	(12)	8871.0839	17.5	0
4	3	1	4	2	2	(12)	11123.1374	–1407.6	5
4	3	2	4	2	3	(12)	7495.9560	968.3	4
4	4	1	4	3	1	(12)	15061.0277	–1598	6
5	0	5	4	0	4	(12)	10162.1993	3.6	–2
5	0	5	4	1	4	(12)	9444.7989	–20.5	0
5	1	4	4	1	3	(12)	11134.6297	169.5	3
5	1	4	4	2	3	(12)	9636.6395	–889.1	–6
5	1	5	4	0	4	(12)	10623.7025	–36.4	–3
5	1	5	4	1	4	(12)	9906.3014	–61.2	–2
5	2	3	4	2	2	(12)	11275.8223	153.5	15
5	2	4	4	1	3	(12)	12969.8931	788.5	3
5	2	4	4	2	3	(12)	11471.9045	–268.4	–4
5	2	4	5	1	5	(12)	7431.1774	381.2	3
5	3	2	4	3	1	(12)	11130.5437	29.2	1
5	3	2	5	2	3	(12)	10977.8737	–1517	6
5	3	3	4	3	2	(12)	11273.6697	–97.8	–1
5	3	3	5	2	4	(12)	7297.7203	1138	5
5	4	1	4	4	1	(12)	11078.3176	19.1	0
5	4	1	5	3	2	(12)	15008.8022	–1607.5	6
5	5	1	4	4	0	(12)	11054.6906	22.4	3
6	0	6	5	0	5	(12)	11951.6386	–14.3	–3
6	0	6	5	1	5	(12)	11490.1360	26.3	–1
6	1	5	5	1	4	(12)	13397.9192	123.8	1
6	1	5	5	2	4	(12)	11562.6528	–498.3	–2
6	1	6	5	0	5	(12)	12215.6480	–72.9	–3
6	1	6	5	1	5	(12)	11754.1450	–32.7	–2
6	2	4	5	2	3	(12)	13580.4694	306.6	1
6	2	5	5	1	4	(12)	15268.5706	372.6	0
6	2	5	5	2	4	(12)	13433.3053	–248.4	–2
6	2	5	6	1	6	(12)	9110.3338	161.6	–1
6	3	3	5	3	2	(12)	13420.6806	43.6	–1
6	3	3	6	2	4	(12)	10818.0850	–1780	5
6	3	4	5	3	3	(12)	13721.9346	–283.6	–3
6	3	4	6	2	5	(12)	7586.3493	1102.5	4
6	4	2	5	4	1	(12)	13327.8872	22.2	–3
6	4	2	6	3	3	(12)	14916.0131	–1624.5	8
6	4	3	6	3	4	(12)	11361.6315	912.3	–2
6	5	1	5	5	1	(12)	13287.2717	26.8	1
6	5	2	6	4	3	(12)	15660.0785	716.3	0
7	0	7	6	0	6	(12)	13721.3487	–25.3	–2

7	0	7	6	1	6	(12)	13457.3397	33.7	–1
7	1	6	6	1	5	(12)	15557.4365	98.8	–1
7	1	6	6	2	5	(12)	13686.8065	–128.6	21
7	1	6	7	0	7	(12)	9339.7813	–19.9	2
7	1	7	6	0	6	(12)	13861.8263	–79	–3
7	1	7	6	1	6	(12)	13597.8172	–20.1	–2
7	2	5	6	2	4	(12)	15833.6357	410.5	1
7	2	6	6	1	5	(12)	17151.5198	59.2	–1
7	2	6	6	2	5	(12)	15280.8671	–190.9	–2
7	2	6	7	0	7	(12)	10933.8625	–61.7	0
7	2	6	7	1	7	(12)	10793.3866	–6.2	2
7	3	4	6	3	3	(12)	15750.1112	77	–1
7	3	4	7	2	5	(12)	10734.5604	–2113.7	3
7	3	5	6	3	4	(12)	16214.1344	–455.9	–6
7	3	5	7	2	6	(12)	8519.6206	841.5	3
7	4	3	6	4	2	(12)	15596.8821	34.6	0
7	4	3	7	3	4	(12)	14762.7837	–1667.2	8
7	4	4	6	4	3	(12)	15717.0920	–91.4	–1
7	4	4	7	3	5	(12)	10864.5881	1275.8	2
7	5	2	6	5	1	(12)	15531.8371	34.6	2
7	5	2	7	4	3	(12)	18802.8377	–1682.2	–15
7	5	3	6	5	2	(12)	15582.3177	–75.8	–1
7	5	3	7	4	4	(12)	15525.3065	734.1	3
7	6	1	6	6	1	(12)	15497.0083	43	2
8	0	8	7	0	7	(12)	15501.7025	–29.7	–2
8	0	8	7	1	7	(12)	15361.2245	23.6	–2
8	1	7	7	1	6	(12)	17546.7374	59.7	–1
8	1	7	7	2	6	(12)	15952.6544	99.6	–1
8	1	7	8	0	8	(12)	11384.8160	69.2	3
8	1	7	8	1	8	(12)	11313.3999	109.2	3
8	1	8	7	0	7	(12)	15573.1184	–69.9	–3
8	1	8	7	1	7	(12)	15432.6408	–16.2	–2
8	2	6	7	2	5	(12)	18119.7581	357.8	0
8	2	7	7	1	6	(12)	18710.9023	–148.7	–1
8	2	7	7	2	6	(12)	17116.8192	–108.9	–1
8	2	7	8	0	8	(12)	12548.9809	–139.2	3
8	2	7	8	1	8	(12)	12477.5650	–99	3
8	3	5	7	3	4	(12)	18116.6876	158	0
8	3	5	8	2	6	(12)	10731.4894	–2314	2
8	3	6	7	3	5	(12)	18550.6845	–459.6	–2
8	3	6	8	1	7	(12)	11117.6480	279.6	–1

8	3	6	8	2	7	(12)	9953.4859	490.8	2
8	4	4	7	4	3	(12)	17890.0091	45.1	1
8	4	4	8	3	5	(12)	14536.1049	–1780.4	9
8	4	5	7	4	4	(12)	18099.3971	–183	–1
8	4	5	8	3	6	(12)	10413.2987	1550.4	1
8	5	3	7	5	2	(12)	17790.6523	42.5	1
8	5	3	8	4	4	(12)	18703.4809	–1684.8	–15
8	5	4	7	5	3	(12)	17867.3510	–99.8	0
8	5	4	8	4	5	(12)	15293.2611	818	5
8	6	2	7	6	1	(12)	17738.5385	55.3	4
8	6	3	7	6	2	(12)	17779.8930	–105.5	2
8	7	1	7	7	1	(12)	17707.1465	76.6	6
9	0	9	8	0	8	(12)	17296.1177	–30.4	–2
9	0	9	8	1	8	(12)	17224.7016	9.6	–2
9	1	8	8	1	7	(12)	19379.9141	9.1	–2
9	1	8	8	2	7	(12)	18215.7510	219.3	0
9	1	9	8	0	8	(12)	17331.3221	–57.7	–3
9	1	9	8	1	8	(12)	17259.9061	–17.6	–2
9	2	7	8	2	6	(12)	20457.0218	299.8	–1
9	2	8	8	1	7	(12)	20131.9390	–249.8	–1
9	2	8	8	2	7	(12)	18967.7748	–40.7	0
9	3	6	8	3	5	(12)	20482.0512	338.9	–1
9	3	6	9	2	7	(12)	10756.5196	–2274.1	3
9	3	7	8	3	6	(12)	20636.3224	–395.3	–1
9	3	7	9	2	8	(12)	11622.0329	135.6	1
9	4	5	8	4	4	(12)	20213.4847	58.2	0
9	4	5	9	3	6	(12)	14267.5373	–2062.2	9
9	4	6	8	4	5	(12)	20579.2361	–403.9	–2
9	4	6	9	3	7	(12)	10356.2119	1541.3	0
9	5	4	8	5	3	(12)	20066.2770	52.5	2
9	5	4	9	4	5	(12)	18556.2765	–1687.3	–10
9	5	5	8	5	4	(12)	20179.7693	–134.2	1
9	6	3	8	6	2	(12)	19991.3517	67.2	4
9	6	4	8	6	3	(12)	20050.5408	–132.8	3
9	7	2	8	7	1	(12)	19946.6306	93.5	7
9	7	3	8	7	2	(12)	19982.8057	–104.5	46
9	8	1	8	8	1	(12)	19917.4908	135.3	10
10	0	10	9	0	9	(12)	19100.4635	–31.2	–2
10	0	10	9	1	9	(12)	19065.2585	–4.5	–2
10	1	9	9	1	8	(12)	21130.3148	–22	1
10	1	10	9	0	9	(12)	19117.4328	–48.5	–3

10	1	10	9	1	9	(12)	19082.2216	–28	–9
10	2	8	9	2	7	(12)	22745.2075	259.6	–1
10	2	8	10	1	9	(12)	11204.9914	–191.3	–5
10	2	9	9	1	8	(12)	21574.8819	–255.7	2
10	2	9	9	2	8	(12)	20822.8617	7.8	5
10	3	7	9	3	6	(12)	22797.9604	545.8	–1
10	3	7	10	2	8	(12)	10809.2727	–1987.7	4
10	3	8	9	3	7	(12)	22537.8688	–285.5	1
10	3	8	10	2	9	(12)	13337.0446	–153.2	1
10	4	6	9	4	5	(12)	22574.4571	81.9	1
10	4	6	10	3	7	(12)	14044.0346	–2525.5	11
10	4	7	9	4	6	(12)	23135.4202	–676.5	0
10	4	7	10	3	8	(12)	10953.7648	1151.8	1
10	5	5	9	5	4	(12)	22361.7722	61.7	2
10	5	6	9	5	5	(12)	22529.3894	–191.7	0
10	6	4	9	6	3	(12)	22257.1044	80.1	4
10	6	5	9	6	4	(12)	22339.4421	–127.2	43
11	0	11	10	0	10	(12)	20910.7104	–37.6	–6
11	0	11	10	1	10	(12)	20893.7442	–17.1	–2
11	1	10	10	1	9	(12)	22868.1036	–26.1	2
11	1	11	10	0	10	(12)	20918.7554	–42.9	–2
11	1	11	10	1	10	(12)	20901.7857	–26	–1
11	2	10	10	1	9	(12)	23115.5555	–205.1	3
11	2	10	10	2	9	(12)	22670.9885	28.6	2
12	0	12	11	0	11	(12)	22724.2641	–38	–2
12	0	12	11	1	11	(12)	22716.2318	–20	6
12	1	11	11	1	10	(12)	24623.9988	–12.4	2
12	1	12	11	0	11	(12)	22728.0213	–44.1	–3
12	1	12	11	1	11	(12)	22719.9847	–30.3	1