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Supporting Information

Magnetic properties of Transition Metal Dimers Probed by Inelastic Neutron Scattering

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Experimental Details

Solvents and reagents were of commercial grade and used without further purification. The synthesis was performed by modifying previously published procedures. Elemental analysis data were collected on an ELEMENTAR Vario Micro Cube.

Preparation of compound Co_2 and Ni_2

A solution of 0.5 mmol 2,2'-bipyrimidine (bpm) in 10 ml of a 1:1 mixture of ethanol/water was dropped to a solution of 1 mmol $M(hfacac)_2$ ($M=Co^{2+}$, Ni^{2+}) in 15 mL of a (3:1) mixture of ethanol/water. The mixture was stirred for several hours at room temperature, after which precipitates were formed. The residual solvent was filtered and kept at -17 ºC to obtain crystals. The solid was washed twice with a mixture of ethanol/water (1:1). The solid was dried at 90 ºC and X-ray diffraction quality crystals were formed by recrystallization from Et_2O. $[(Ni(hfacac)_2)_2(bpm)]$ (**Ni_2**): pale green crystals; yield 41%; elemental analysis calculated (%) for $C_{28}H_{14}F_{24}N_4O_8Ni_2$: C 30.36, H 1.27, N 5.06; found: C 30.52, H 1.18, N 5.15; $[(Co(hfacac)_2)_2(bpm)]$ (**Co_2**): red crystals; yield 57%; elemental

analysis calculated (%) for $C_{28}H_{14}F_{24}N_4O_8Co_2$: C 30.34, H 1.27, N 5.06; found: C 30.54, H 1.16, N 5.10.

Table S1. Continuous shaped measures (CShM) for compound **Co_2** and **Ni_2**.

	Co(1)	**Co(2)**	**Ni(1)**	**Ni(2)**
HP-6	31.647	31.337	31.926	31.357
PPY-6	27.333	27.331	27.982	27.922
OC-6	0.402	0.508	0.247	0.326
TPR 6	14.290	14.716	14.979	14.959
JPPY-6	31.076	31.031	31.661	31.494

HP-6 =(D_{6h}) Hexagon
PPY-6 =(C_{5v}) Pentagonal pyramid
OC-6 =(Oh) Octahedron
TPR-6 =(D_{3h}) Trigonal prism
JPPY-6 =(C_{5v}) Johnson pentagonal pyramid J2

Inelastic Neutron Scattering spectrum of Ni_2

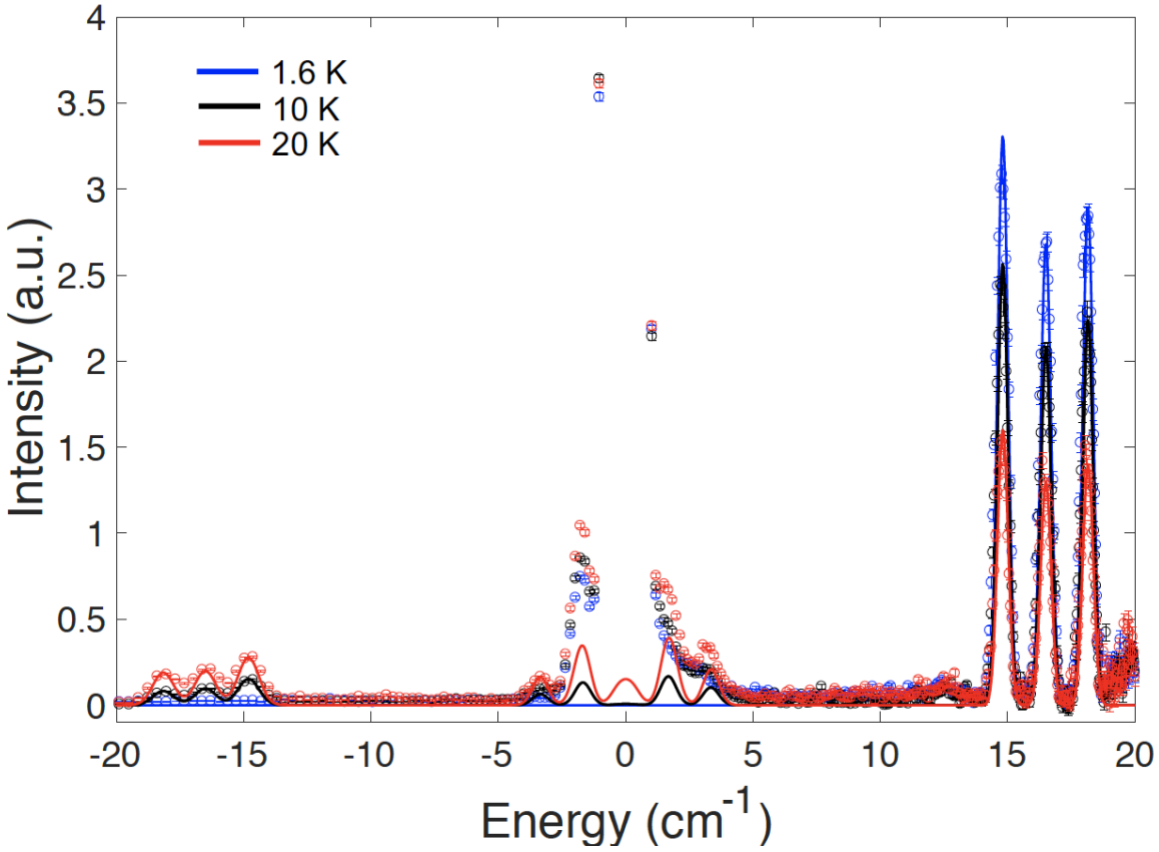

Figure S1: Measured (symbols) and calculated (continuous lines) energy spectrum of **Ni_2** at 1.6, 10 and 20 K both on the energy gain and energy loss sides.

Inelastic Neutron Scattering data of Co_2

Table S2. Energy spectrum (a.u.) of Co_2 collected at 1.6 K with incident neutron wavelength 4.8 Å.

E (cm^{-1})	I (a.u.)	err (a.u.)
-16.4038	-0.4819	0.0027
-16.0649	-0.4562	0.0028
-15.7299	-0.4399	0.0027
-15.3986	-0.4171	0.0028
-15.0709	-0.3937	0.0029
-14.7470	-0.3743	0.0029
-14.4266	-0.3575	0.0029
-14.1098	-0.3347	0.0030
-13.7965	-0.3164	0.0030
-13.4865	-0.2994	0.0031
-13.1800	-0.2809	0.0031
-12.8768	-0.2691	0.0031
-12.5768	-0.2497	0.0032
-12.2802	-0.2360	0.0032
-11.9867	-0.2153	0.0033
-11.6963	-0.2003	0.0034
-11.4091	-0.1881	0.0034
-11.1249	-0.1765	0.0034
-10.8438	-0.1655	0.0034
-10.5656	-0.1478	0.0035
-10.2903	-0.1369	0.0035
-10.0179	-0.1225	0.0036
-9.7484	-0.1122	0.0037
-9.4817	-0.1049	0.0036
-9.2177	-0.0933	0.0037
-8.9566	-0.0797	0.0038
-8.6980	-0.0720	0.0038
-8.4421	-0.0643	0.0038
-8.1889	-0.0569	0.0038
-7.9382	-0.0431	0.0039
-7.6901	-0.0283	0.0041
-7.4445	-0.0233	0.0041
-7.2014	-0.0174	0.0041
-6.9608	-0.0092	0.0042
-6.7225	0.0044	0.0043
-6.4867	0.0095	0.0043
-6.2532	0.0183	0.0044
-6.0220	0.0187	0.0043
-5.7931	0.0220	0.0043
-5.5664	0.0334	0.0045

-5.3420	0.0473	0.0047
-5.1198	0.0473	0.0046
-4.8998	0.0521	0.0047
-4.6819	0.0579	0.0047
-4.4661	0.0681	0.0049
-4.2525	0.0729	0.0049
-4.0408	0.0740	0.0049
-3.8312	0.0838	0.0051
-3.6237	0.0914	0.0052
-3.4181	0.0973	0.0053
-3.2144	0.1070	0.0055
-3.0127	0.1095	0.0055
-2.8130	0.1254	0.0058
-2.6151	0.1295	0.0059
-2.4190	0.1389	0.0060
-2.2248	0.1593	0.0064
-2.0324	0.1714	0.0066
-1.8418	0.1855	0.0069
-1.6530	0.2013	0.0072
-1.4659	0.2218	0.0075
-1.2806	0.2937	0.0085
-1.0970	1.2631	0.0162
-0.9150	11.5517	0.0506
-0.7347	65.6643	0.1247
-0.5561	219.5674	0.2324
-0.3791	485.7857	0.3501
-0.2037	775.6459	0.4464
-0.0298	936.4140	0.4940
0.1424	869.7190	0.4788
0.3131	616.7688	0.4047
0.4823	321.7985	0.2927
0.6500	114.7852	0.1741
0.8162	25.3017	0.0806
0.9809	3.6178	0.0303
1.1441	0.8894	0.0158
1.3059	0.6509	0.0139
1.4663	0.5969	0.0134
1.6253	0.5193	0.0126
1.7829	0.4741	0.0121
1.9391	0.4501	0.0119
2.0939	0.4219	0.0116
2.2474	0.4015	0.0115
2.3996	0.4148	0.0117
2.5505	0.4157	0.0118
2.7000	0.4006	0.0117
2.8483	0.3711	0.0114

2.9953	0.3527	0.0112
3.1411	0.3396	0.0111
3.2856	0.3112	0.0108
3.4289	0.2986	0.0107
3.5710	0.2873	0.0106
3.7119	0.2689	0.0104
3.8516	0.2513	0.0102
3.9901	0.2631	0.0105
4.1275	0.2418	0.0102
4.2637	0.2441	0.0103
4.3988	0.2507	0.0105
4.5328	0.2545	0.0107
4.6656	0.2438	0.0106
4.7974	0.2590	0.0110
4.9281	0.2641	0.0112
5.0577	0.2566	0.0112
5.1863	0.2701	0.0115
5.3138	0.2822	0.0118
5.4403	0.2782	0.0119
5.5657	0.2594	0.0116
5.6901	0.2554	0.0117
5.8136	0.2628	0.0119
5.9360	0.2741	0.0122
6.0575	0.3037	0.0129
6.1779	0.3277	0.0134
6.2974	0.4178	0.0148
6.4160	0.5988	0.0174
6.5336	0.8898	0.0209
6.6503	1.2904	0.0249
6.7661	1.7887	0.0292
6.8810	2.4168	0.0339
6.9949	3.0386	0.0381
7.1080	3.6905	0.0421
7.2202	4.1339	0.0447
7.3315	4.3629	0.0462
7.4419	4.2998	0.0461
7.5515	4.0259	0.0449
7.6602	3.6123	0.0429
7.7681	3.1489	0.0403
7.8752	2.6283	0.0372
7.9814	2.1665	0.0342
8.0869	1.7872	0.0314
8.1915	1.4701	0.0289
8.2953	1.1683	0.0262
8.3984	0.9341	0.0240
8.5006	0.7827	0.0224

8.6021	0.7085	0.0216
8.7028	0.6388	0.0209
8.8028	0.5592	0.0200
8.9020	0.5083	0.0194
9.0005	0.4397	0.0186
9.0983	0.3938	0.0180
9.1952	0.3444	0.0174
9.2915	0.2965	0.0167
9.3871	0.2808	0.0166
9.4820	0.2726	0.0166
9.5762	0.2778	0.0168
9.6696	0.2658	0.0167
9.7624	0.2950	0.0174
9.8545	0.3289	0.0181
9.9460	0.3730	0.0190
10.0367	0.4661	0.0206
10.1268	0.6049	0.0228
10.2163	0.7477	0.0249
10.3051	0.7790	0.0254
10.3933	0.7766	0.0256
10.4808	0.8241	0.0263
10.5678	0.7694	0.0258
10.6540	0.6561	0.0245
10.7397	0.5604	0.0233
10.8247	0.4794	0.0223
10.9092	0.3908	0.0210
10.9931	0.3337	0.0202
11.0763	0.3092	0.0200
11.1590	0.3180	0.0203
11.2411	0.3631	0.0212
11.3226	0.3602	0.0213
11.4035	0.3998	0.0222
11.4839	0.4556	0.0232
11.5637	0.5240	0.0245
11.6430	0.6901	0.0270
11.7217	0.8491	0.0293
11.7999	1.0196	0.0317
11.8775	1.2310	0.0343
11.9546	1.3616	0.0360
12.0311	1.4403	0.0370
12.1072	1.5031	0.0379
12.1827	1.5202	0.0383
12.2577	1.4248	0.0375
12.3321	1.3322	0.0367
12.4061	1.2363	0.0358
12.4796	1.1934	0.0355

12.5526	1.1656	0.0354
12.6251	1.2257	0.0363
12.6970	1.2506	0.0368
12.7686	1.3387	0.0380
12.8395	1.4603	0.0396
12.9101	1.5804	0.0411
12.9802	1.6819	0.0424
13.0498	1.7945	0.0438
13.1189	1.8975	0.0451
13.1877	1.9032	0.0454
13.2559	1.8680	0.0453
13.3236	1.8003	0.0448
13.3910	1.7897	0.0450
13.4579	1.6823	0.0440
13.5244	1.6344	0.0438
13.5904	1.4453	0.0419
13.6560	1.3085	0.0405
13.7211	1.2060	0.0395
13.7859	1.1007	0.0383
13.8502	1.0055	0.0373
13.9141	0.9116	0.0363
13.9776	0.8783	0.0360
14.0406	0.7966	0.0350
14.1033	0.7444	0.0344
14.1655	0.7082	0.0341
14.2275	0.6964	0.0341
14.2890	0.7010	0.0344
14.3500	0.6937	0.0345
14.4107	0.6218	0.0336
14.4710	0.6150	0.0336
14.5309	0.6887	0.0350
14.5904	0.7127	0.0356
14.6497	0.8058	0.0372
14.7084	0.8920	0.0387
14.7668	0.9429	0.0397
14.8249	0.9865	0.0405
14.8826	1.0472	0.0416
14.9399	1.0230	0.0414
14.9969	1.0061	0.0414
15.0535	1.0194	0.0419
15.1098	1.0643	0.0427
15.1657	1.0779	0.0431
15.2213	1.0734	0.0433
15.2765	1.0147	0.0427
15.3314	1.0756	0.0438
15.3860	1.1458	0.0449

15.4402	1.0659	0.0441
15.4940	1.1157	0.0450
15.5476	1.0495	0.0443
15.6008	0.9888	0.0436
15.6537	0.9587	0.0434
15.7063	0.8346	0.0418
15.7586	0.7560	0.0407
15.8105	0.7151	0.0403
15.8622	0.5945	0.0385
15.9135	0.5747	0.0384
15.9645	0.5317	0.0378
16.0153	0.4840	0.0371
16.0657	0.4787	0.0372
16.1158	0.5119	0.0381
16.1655	0.5294	0.0386
16.2150	0.5757	0.0396
16.2642	0.5420	0.0392
16.3132	0.5952	0.0404
16.3618	0.5758	0.0403
16.4102	0.5996	0.0409
16.4582	0.6359	0.0418
16.5060	0.6024	0.0414
16.5535	0.5757	0.0411
16.6007	0.5618	0.0411
16.6477	0.5593	0.0413
16.6943	0.5488	0.0413
16.7408	0.4834	0.0403
16.7868	0.4963	0.0407
16.8327	0.5246	0.0415
16.8783	0.4664	0.0406
16.9236	0.4330	0.0402
16.9687	0.4077	0.0399
17.0135	0.3981	0.0399
17.0581	0.4239	0.0406
17.1023	0.4182	0.0407
17.1464	0.5323	0.0432
17.1902	0.4936	0.0427
17.2337	0.3918	0.0409
17.2771	0.4996	0.0433
17.3200	0.5431	0.0443
17.3629	0.4954	0.0436
17.4055	0.5127	0.0442
17.4477	0.4519	0.0432
17.4898	0.4696	0.0437
17.5317	0.4994	0.0446
17.5733	0.5276	0.0454

17.6147	0.4685	0.0444
17.6558	0.5289	0.0459
17.6967	0.5643	0.0468
17.7374	0.5981	0.0477
17.7779	0.5649	0.0473
17.8181	0.5648	0.0475
17.8581	0.5649	0.0477
17.8979	0.5526	0.0477
17.9375	0.5430	0.0477
17.9768	0.6452	0.0500
18.0160	0.6077	0.0495
18.0548	0.5971	0.0495
18.0935	0.6374	0.0506
18.1320	0.5962	0.0500
18.1703	0.5649	0.0496
18.2084	0.5705	0.0499
18.2463	0.6036	0.0508
18.2840	0.5731	0.0505
18.3214	0.6032	0.0513
18.3587	0.6041	0.0516
18.3957	0.5844	0.0514
18.4325	0.5855	0.0516
18.4692	0.5765	0.0518
18.5057	0.5992	0.0525
18.5419	0.5869	0.0524
18.5780	0.6087	0.0531
18.6139	0.5665	0.0525
18.6496	0.6654	0.0548
18.6851	0.7286	0.0563
18.7203	0.6582	0.0551
18.7555	0.6372	0.0549
18.7904	0.6788	0.0561
18.8252	0.7660	0.0580
18.8597	0.6474	0.0559
18.8941	0.6816	0.0568
18.9283	0.7240	0.0580
18.9623	0.7960	0.0596
18.9961	0.8773	0.0615
19.0298	0.8943	0.0621
19.0633	0.8821	0.0621
19.0966	0.8894	0.0625
19.1297	0.9193	0.0634
19.1627	1.0104	0.0654
19.1955	0.9622	0.0647
19.2281	0.9207	0.0642
19.2606	0.9376	0.0648

19.2928	0.9299	0.0649
19.3250	0.8884	0.0643
19.3570	0.9201	0.0652
19.3887	0.8860	0.0648
19.4204	0.9409	0.0662
19.4518	0.9335	0.0663
19.4832	0.9279	0.0665
19.5143	0.8913	0.0660
19.5453	0.9693	0.0678
19.5761	0.9122	0.0670
19.6067	0.9531	0.0681
19.6373	0.9879	0.0690
19.6676	0.9399	0.0684
19.6979	1.0170	0.0702
19.7279	1.0510	0.0711
19.7578	1.0805	0.0719
19.7876	1.0565	0.0718
19.8172	1.0967	0.0729
19.8467	1.1094	0.0734
19.8760	1.0087	0.0717
19.9051	1.0443	0.0727
19.9341	1.0376	0.0729
19.9630	0.8977	0.0703
19.9917	0.9981	0.0727
20.0204	0.8262	0.0693
20.0488	0.7251	0.0674
20.0771	0.6231	0.0654
20.1053	0.4427	0.0612
20.1333	0.3908	0.0603
20.1612	0.2050	0.0556
20.1889	0.1128	0.0532
20.2166	-0.0918	0.0472
20.2440	-0.4939	0.0330

Table S3. Energy spectrum (a.u.) of Co_2 collected at 10 K with incident neutron wavelength 4.8 Å.

E (cm^{-1})	I (a.u.)	err (a.u.)
-20.3352	0.0305	0.0024
-19.9512	0.0300	0.0024
-19.5715	0.0314	0.0024
-19.1964	0.0352	0.0025
-18.8255	0.0387	0.0026
-18.4590	0.0365	0.0026
-18.0968	0.0363	0.0026
-17.7386	0.0404	0.0027

-17.3846	0.0429	0.0028
-17.0346	0.0375	0.0027
-16.6886	0.0411	0.0028
-16.3465	0.0435	0.0029
-16.0082	0.0504	0.0030
-15.6738	0.0645	0.0033
-15.3431	0.0752	0.0034
-15.0162	0.0820	0.0035
-14.6928	0.0805	0.0036
-14.3730	0.0839	0.0036
-14.0567	0.0915	0.0038
-13.7440	0.1086	0.0040
-13.4346	0.1312	0.0044
-13.1286	0.1445	0.0045
-12.8260	0.1472	0.0046
-12.5266	0.1413	0.0046
-12.2304	0.1336	0.0045
-11.9375	0.1234	0.0044
-11.6477	0.0996	0.0042
-11.3609	0.0796	0.0039
-11.0773	0.0802	0.0040
-10.7966	0.0879	0.0041
-10.5189	0.1015	0.0043
-10.2441	0.1050	0.0044
-9.9722	0.0883	0.0042
-9.7031	0.0771	0.0041
-9.4369	0.0809	0.0042
-9.1734	0.0847	0.0043
-8.9126	0.1039	0.0046
-8.6546	0.1476	0.0052
-8.3991	0.2228	0.0061
-8.1463	0.3344	0.0072
-7.8961	0.4827	0.0085
-7.6484	0.6204	0.0096
-7.4032	0.7076	0.0102
-7.1605	0.6922	0.0102
-6.9203	0.5466	0.0092
-6.6824	0.3760	0.0079
-6.4469	0.2602	0.0069
-6.2138	0.1862	0.0061
-5.9830	0.1603	0.0059
-5.7545	0.1527	0.0058
-5.5282	0.1421	0.0057
-5.3042	0.1394	0.0057
-5.0824	0.1265	0.0056
-4.8627	0.1159	0.0055

-4.6451	0.1010	0.0053
-4.4297	0.0892	0.0052
-4.2164	0.0948	0.0053
-4.0051	0.0984	0.0054
-3.7959	0.0969	0.0055
-3.5886	0.1071	0.0057
-3.3834	0.1114	0.0058
-3.1800	0.1205	0.0059
-2.9787	0.1294	0.0061
-2.7792	0.1371	0.0063
-2.5816	0.1970	0.0071
-2.3859	0.3440	0.0087
-2.1920	0.5828	0.0110
-1.9999	0.8159	0.0128
-1.8096	0.9227	0.0137
-1.6211	0.8512	0.0132
-1.4343	0.6863	0.0121
-1.2492	0.6498	0.0118
-1.0659	2.3328	0.0196
-0.8842	16.4845	0.0525
-0.7042	77.4532	0.1189
-0.5258	230.8580	0.2108
-0.3491	473.0290	0.3063
-0.1739	713.4420	0.3798
-0.0004	823.4350	0.4106
0.1716	733.1820	0.3890
0.3421	498.5640	0.3211
0.5110	249.0980	0.2264
0.6784	84.6007	0.1309
0.8444	17.8329	0.0595
1.0088	2.6041	0.0236
1.1718	0.8383	0.0145
1.3334	0.6749	0.0133
1.4935	0.6197	0.0129
1.6523	0.5853	0.0127
1.8096	0.5289	0.0122
1.9656	0.4637	0.0117
2.1202	0.4036	0.0112
2.2735	0.3410	0.0106
2.4255	0.3173	0.0103
2.5761	0.3204	0.0104
2.7254	0.3153	0.0104
2.8735	0.3244	0.0106
3.0203	0.3341	0.0108
3.1659	0.2753	0.0102
3.3102	0.2596	0.0100

3.4533	0.2320	0.0098
3.5952	0.2041	0.0095
3.7358	0.1993	0.0095
3.8754	0.1820	0.0093
4.0137	0.1786	0.0093
4.1509	0.2262	0.0100
4.2869	0.1974	0.0097
4.4218	0.1932	0.0097
4.5556	0.1924	0.0098
4.6883	0.2232	0.0103
4.8199	0.2899	0.0113
4.9504	0.2660	0.0110
5.0798	0.2732	0.0112
5.2082	0.2766	0.0113
5.3355	0.2861	0.0115
5.4618	0.3027	0.0118
5.5871	0.3170	0.0121
5.7114	0.3522	0.0126
5.8346	0.3755	0.0130
5.9569	0.3786	0.0131
6.0782	0.3836	0.0132
6.1985	0.3861	0.0134
6.3179	0.3922	0.0135
6.4363	0.4474	0.0142
6.5537	0.5948	0.0159
6.6703	0.8015	0.0181
6.7859	1.0633	0.0205
6.9006	1.3467	0.0228
7.0144	1.6621	0.0252
7.1273	1.9869	0.0274
7.2393	2.1919	0.0289
7.3505	2.2825	0.0296
7.4608	2.2854	0.0297
7.5702	2.1420	0.0290
7.6788	1.8861	0.0275
7.7866	1.6308	0.0259
7.8935	1.3672	0.0241
7.9996	1.1572	0.0225
8.1049	0.9228	0.0206
8.2094	0.7348	0.0189
8.3131	0.6121	0.0177
8.4160	0.5052	0.0166
8.5181	0.4782	0.0164
8.6195	0.4147	0.0157
8.7201	0.3771	0.0154
8.8199	0.3675	0.0153

8.9190	0.2961	0.0145
9.0174	0.2660	0.0141
9.1150	0.2482	0.0140
9.2118	0.2142	0.0136
9.3081	0.1935	0.0133
9.4035	0.1927	0.0134
9.4982	0.1939	0.0135
9.5923	0.1879	0.0135
9.6856	0.1705	0.0133
9.7783	0.2035	0.0140
9.8703	0.2107	0.0142
9.9616	0.2373	0.0147
10.0523	0.3549	0.0165
10.1423	0.3605	0.0166
10.2317	0.4071	0.0174
10.3203	0.4593	0.0182
10.4084	0.4756	0.0185
10.4958	0.4601	0.0184
10.5826	0.4238	0.0181
10.6688	0.3569	0.0173
10.7544	0.3185	0.0169
10.8393	0.2933	0.0166
10.9237	0.2472	0.0159
11.0074	0.2063	0.0154
11.0906	0.2667	0.0165
11.1732	0.2063	0.0156
11.2552	0.2409	0.0163
11.3366	0.2722	0.0169
11.4174	0.2592	0.0168
11.4977	0.2778	0.0172
11.5774	0.3175	0.0179
11.6566	0.3745	0.0188
11.7352	0.4382	0.0199
11.8133	0.5423	0.0214
11.8908	0.6129	0.0225
11.9678	0.7127	0.0238
12.0443	0.7943	0.0249
12.1202	0.7928	0.0250
12.1957	0.7541	0.0247
12.2705	0.7396	0.0246
12.3450	0.7195	0.0245
12.4188	0.6917	0.0243
12.4922	0.6688	0.0242
12.5652	0.6454	0.0240
12.6375	0.6316	0.0240
12.7094	0.6812	0.0248

12.7808	0.7594	0.0258
12.8518	0.7609	0.0259
12.9223	0.8852	0.0276
12.9922	0.9938	0.0289
13.0618	0.9672	0.0288
13.1309	1.0405	0.0298
13.1995	1.0187	0.0297
13.2677	1.0096	0.0298
13.3353	0.9153	0.0289
13.4026	0.9418	0.0293
13.4695	0.8994	0.0289
13.5359	0.8546	0.0286
13.6018	0.8214	0.0283
13.6672	0.6484	0.0263
13.7323	0.6570	0.0266
13.7970	0.6162	0.0262
13.8613	0.5987	0.0261
13.9251	0.5389	0.0253
13.9885	0.4927	0.0250
14.0515	0.4578	0.0246
14.1142	0.4344	0.0244
14.1764	0.4141	0.0243
14.2381	0.4825	0.0254
14.2995	0.3532	0.0236
14.3606	0.3783	0.0241
14.4211	0.4108	0.0247
14.4814	0.3716	0.0242
14.5412	0.4035	0.0250
14.6008	0.4104	0.0253
14.6598	0.4448	0.0260
14.7186	0.4957	0.0268
14.7769	0.5298	0.0275
14.8349	0.5507	0.0280
14.8926	0.6067	0.0289
14.9499	0.6059	0.0291
15.0067	0.5397	0.0283
15.0633	0.5611	0.0288
15.1195	0.5787	0.0292
15.1754	0.5734	0.0292
15.2309	0.5446	0.0289
15.2860	0.5735	0.0296
15.3409	0.5698	0.0297
15.3954	0.5679	0.0299
15.4495	0.5754	0.0302
15.5034	0.5875	0.0305
15.5569	0.5501	0.0301

15.6100	0.5206	0.0298
15.6629	0.4718	0.0293
15.7155	0.4460	0.0290
15.7676	0.4093	0.0285
15.8195	0.3609	0.0280
15.8711	0.2931	0.0270
15.9224	0.2837	0.0269
15.9733	0.4151	0.0294
16.0240	0.2933	0.0275
16.0744	0.2509	0.0269
16.1244	0.2556	0.0273
16.1741	0.3431	0.0288
16.2236	0.3543	0.0292
16.2728	0.3302	0.0289
16.3217	0.3595	0.0296
16.3702	0.2940	0.0287
16.4185	0.3188	0.0295
16.4665	0.3071	0.0294
16.5143	0.2823	0.0292
16.5617	0.2614	0.0290
16.6089	0.2861	0.0296
16.6558	0.2715	0.0295
16.7025	0.2434	0.0292
16.7487	0.2665	0.0298
16.7948	0.3141	0.0308
16.8407	0.2801	0.0304
16.8862	0.2645	0.0303
16.9315	0.2887	0.0310
16.9765	0.2074	0.0295
17.0213	0.1932	0.0296
17.0658	0.3555	0.0325
17.1100	0.2261	0.0304
17.1541	0.2267	0.0306
17.1978	0.2361	0.0312
17.2413	0.3841	0.0340
17.2846	0.2229	0.0310
17.3275	0.2268	0.0316
17.3703	0.2007	0.0313
17.4128	0.1941	0.0314
17.4551	0.1992	0.0316
17.4972	0.1907	0.0317
17.5389	0.2259	0.0326
17.5805	0.2127	0.0324
17.6219	0.2193	0.0326
17.6629	0.2758	0.0341
17.7038	0.2637	0.0339

17.7445	0.2854	0.0347
17.7849	0.2471	0.0342
17.8251	0.2287	0.0341
17.8650	0.2511	0.0348
17.9048	0.2275	0.0346
17.9443	0.2422	0.0351
17.9836	0.4163	0.0383
18.0227	0.4303	0.0389
18.0616	0.2435	0.0357
18.1003	0.4336	0.0394
18.1388	0.3011	0.0371
18.1770	0.2506	0.0365
18.2150	0.2845	0.0374
18.2528	0.2698	0.0372
18.2905	0.5820	0.0428
18.3279	0.2819	0.0378
18.3651	0.2258	0.0372
18.4021	0.2158	0.0372
18.4390	0.2949	0.0389
18.4756	0.2819	0.0387
18.5120	0.2567	0.0387
18.5482	0.2344	0.0386
18.5843	0.2385	0.0388
18.6201	0.2559	0.0394
18.6557	0.3696	0.0417
18.6912	0.3755	0.0422
18.7265	0.3542	0.0419
18.7615	0.4684	0.0442
18.7965	0.2875	0.0412
18.8312	0.5118	0.0452
18.8658	0.3526	0.0425
18.9000	0.5276	0.0462
18.9342	0.3040	0.0423
18.9682	0.3415	0.0434
19.0021	0.4229	0.0452
19.0357	0.3609	0.0444
19.0691	0.4352	0.0459
19.1024	0.4259	0.0458
19.1355	0.4100	0.0459
19.1685	0.4848	0.0474
19.2012	0.4916	0.0477
19.2338	0.3921	0.0464
19.2662	0.3835	0.0463
19.2985	0.4721	0.0485
19.3306	0.4348	0.0477
19.3625	0.4228	0.0479

19.3943	0.4353	0.0483
19.4258	0.4383	0.0488
19.4573	0.6746	0.0527
19.4886	0.4006	0.0485
19.5197	0.4205	0.0495
19.5507	0.4146	0.0494
19.5815	0.4241	0.0501
19.6122	0.5253	0.0518
19.6426	0.4711	0.0510
19.6730	0.3652	0.0497
19.7031	0.3816	0.0504
19.7331	0.3731	0.0505
19.7631	0.4245	0.0517
19.7927	0.4847	0.0531
19.8223	0.5174	0.0539
19.8518	0.4408	0.0530
19.8811	0.4644	0.0537
19.9102	0.4693	0.0541
19.9392	0.5805	0.0563
19.9681	0.5206	0.0555
19.9967	0.4046	0.0537
20.0254	0.3015	0.0519
20.0537	0.3118	0.0523
20.0821	0.2217	0.0509
20.1102	0.4011	0.0547
20.1382	0.3110	0.0534
20.1660	0.0055	0.0469
20.1938	-0.1789	0.0436
20.2214	-0.4251	0.0367
20.2489	-0.4978	0.0377