

Supplementary Data

The elastic tensor of monoclinic alkali feldspars

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This document contains the measured wave velocities for the H002 and H003 feldspar samples, and the results of the data inversion to provide the c_{ij} that are reported in the paper.

Sample: H002

Density (gm/cc) = 2.567

Number of crystals = 9

Number of measured velocities = 207

root-mean-square velocity misfit = 11 m/s

Euler Angles (Koch convention):

rotate cartesian coordinates of crystal into laboratory coordinates

first angle rotate about z, second angle rotate about y', third angle rotate about z''

Crystal	1	2	3	4	5	6	7	8	9
	268.9	-0.1	-0.3	158.6	201.0	30.6	3.0	228.8	-7.7
	92.1	91.0	55.2	122.9	123.5	90.5	157.1	142.3	27.4
	173.2	223.8	73.7	58.2	106.0	241.8	340.6	221.1	29.3

Elastic Constants (GPa) and 2*sigma formal uncertainties

11	22	33	44	55	66	12	13	15	23
69.3	176.2	160.8	19.2	19.4	33.4	41.6	24.0	0.3	14.3
0.6	5.3	2.3	0.1	0.1	0.2	1.6	0.6	0.1	3.2

25	35	46	14	16	24	26	34	36	45	56
-9.4	7.1	-11.5								
0.6	0.5	0.1								

	Voigt		Ruess		Hill
Bulk Modulus	62.9	1.1	54.7	0.7	58.8
Shear Modulus	36.1	0.5	24.1	0.0	30.1

X-ray compliances (GPa⁻¹)*1e3 used in fitting:

11.40	2.51	4.31	0.00	-0.49	0.00	Bulk Modulus (GPa)	54.9
0.05	0.12	0.02	-	0.03	-		0.2

Compliances from fit to velocities:

11.37	2.62	4.31	0.00	-0.49	0.00
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crystal	lab angle	Direction cosines			Vmeasured	Vcalculated
1	0	0.1179	-0.0385	0.9923	2.499	2.490
1	0	0.1179	-0.0385	0.9923	2.501	2.490
1	10	-0.0563	-0.0353	0.9978	2.575	2.592
1	20	-0.2288	-0.0310	0.9730	2.680	2.677
1	30	-0.3943	-0.0257	0.9186	2.841	2.823
1	30	-0.3943	-0.0257	0.9186	2.842	2.823
1	40	-0.5479	-0.0197	0.8363	3.013	3.000
1	50	-0.6848	-0.0131	0.7286	3.193	3.174
1	60	-0.8009	-0.0061	0.5988	3.328	3.315
1	90	-0.9928	0.0152	0.1186	3.481	3.455
1	95	-0.9993	0.0185	0.0316	3.451	3.432
1	105	-0.9895	0.0247	-0.1423	2.862	2.867
1	105	-0.9895	0.0247	-0.1423	2.869	2.867
1	110	-0.9733	0.0275	-0.2280	2.921	2.913
1	115	-0.9496	0.0301	-0.3119	2.875	2.874
1	120	-0.9188	0.0325	-0.3935	2.801	2.795
1	130	-0.8363	0.0364	-0.5470	2.592	2.591
1	140	-0.7285	0.0393	-0.6839	2.395	2.390
1	145	-0.6660	0.0403	-0.7448	2.312	2.309
1	150	-0.5985	0.0410	-0.8001	2.264	2.250
1	160	-0.4504	0.0414	-0.8919	2.218	2.222
1	170	-0.2885	0.0406	-0.9566	2.302	2.318
1	180	-0.1179	0.0385	-0.9923	2.490	2.490
2	0	0.0119	-0.6926	0.7212	2.851	2.847
2	10	0.0094	-0.8074	0.5900	2.979	2.975
2	20	0.0067	-0.8976	0.4408	3.023	3.017
2	20	0.0067	-0.8976	0.4408	3.008	3.017
2	20	0.0067	-0.8976	0.4408	3.015	3.017
2	30	0.0037	-0.9605	0.2783	2.753	2.766
2	30	0.0037	-0.9605	0.2783	3.685	3.681
2	35	0.0022	-0.9811	0.1936	2.541	2.531
2	35	0.0022	-0.9811	0.1936	3.600	3.600
2	40	0.0007	-0.9942	0.1073	2.346	2.330
2	40	0.0007	-0.9942	0.1073	3.567	3.578
2	40	0.0007	-0.9942	0.1073	3.569	3.578
2	40	0.0007	-0.9942	0.1073	3.576	3.578
2	50	-0.0024	-0.9978	-0.0669	2.290	2.269
2	50	-0.0024	-0.9978	-0.0669	3.564	3.575
2	55	-0.0039	-0.9881	-0.1536	2.441	2.429
2	55	-0.0039	-0.9881	-0.1536	3.578	3.585
2	60	-0.0054	-0.9710	-0.2391	2.653	2.659
2	60	-0.0054	-0.9710	-0.2391	2.652	2.659
2	60	-0.0054	-0.9710	-0.2391	3.629	3.633
2	60	-0.0054	-0.9710	-0.2391	3.627	3.633
2	70	-0.0082	-0.9147	-0.4041	2.994	2.996
2	80	-0.0108	-0.8306	-0.5568	2.994	2.998

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2	90	-0.0131	-0.7213	-0.6925	2.880	2.880
2	100	-0.0149	-0.5901	-0.8072	2.734	2.738
2	110	-0.0163	-0.4409	-0.8974	2.605	2.615
2	120	-0.0172	-0.2783	-0.9603	2.541	2.548
2	130	-0.0176	-0.1073	-0.9941	2.528	2.538
2	145	-0.0172	0.1537	-0.9880	2.543	2.547
2	150	-0.0168	0.2392	-0.9708	2.534	2.543
2	160	-0.0156	0.4042	-0.9146	2.586	2.592
2	170	-0.0139	0.5569	-0.8305	2.698	2.705
3	10	0.0679	0.9936	-0.0907	2.235	2.245
3	20	-0.0315	0.9981	0.0524	2.220	2.225
3	30	-0.1300	0.9724	0.1939	2.326	2.337
3	40	-0.2245	0.9171	0.3295	2.528	2.535
3	50	-0.3122	0.8339	0.4551	2.737	2.735
3	60	-0.3904	0.7254	0.5669	2.798	2.811
3	65	-0.4252	0.6627	0.6165	2.776	2.788
3	70	-0.4568	0.5949	0.6614	2.744	2.749
3	80	-0.5093	0.4463	0.7359	2.688	2.693
3	90	-0.5463	0.2841	0.7880	2.742	2.741
3	95	-0.5586	0.1994	0.8051	2.794	2.817
3	125	-0.5423	-0.3172	0.7780	2.711	2.721
3	130	-0.5247	-0.3987	0.7521	2.689	2.695
3	140	-0.4778	-0.5519	0.6835	2.726	2.727
3	150	-0.4163	-0.6883	0.5941	2.791	2.801
3	160	-0.3422	-0.8038	0.4866	2.753	2.774
3	165	-0.3011	-0.8526	0.4271	2.696	2.697
3	170	-0.2577	-0.8949	0.3644	2.587	2.596
4	0	-0.0441	-0.8960	-0.4418	2.662	2.653
4	10	-0.1515	-0.9382	-0.3112	2.442	2.445
4	20	-0.2543	-0.9519	-0.1711	2.311	2.310
4	30	-0.3494	-0.9366	-0.0258	2.293	2.298
4	40	-0.4339	-0.8929	0.1202	2.406	2.406
4	50	-0.5052	-0.8221	0.2626	2.583	2.588
4	60	-0.5612	-0.7262	0.3971	2.781	2.772
4	70	-0.6001	-0.6084	0.5195	2.823	2.824
4	80	-0.6207	-0.4720	0.6260	2.773	2.775
4	90	-0.6225	-0.3213	0.7136	2.749	2.751
4	100	-0.6054	-0.1608	0.7795	2.807	2.796
4	110	-0.5699	0.0046	0.8217	2.909	2.911
4	120	-0.5171	0.1698	0.8389	2.945	2.948
4	130	-0.4486	0.3298	0.8307	2.705	2.706
4	130	-0.4486	0.3298	0.8307	3.332	3.323
4	140	-0.3664	0.4799	0.7972	2.675	2.655
4	150	-0.2731	0.6153	0.7395	2.758	2.757
4	160	-0.1715	0.7321	0.6593	2.876	2.870
4	170	-0.0647	0.8266	0.5590	2.841	2.839
4	180	0.0441	0.8960	0.4418	2.646	2.653
4	180	0.0441	0.8960	0.4418	2.669	2.653
5	0	0.2023	-0.9519	0.2299	2.359	2.349
5	10	0.0961	-0.9258	0.3656	2.520	2.520
5	20	-0.0131	-0.8715	0.4902	2.735	2.731
5	30	-0.1218	-0.7908	0.5999	2.865	2.868
5	40	-0.2269	-0.6860	0.6914	2.834	2.827
5	50	-0.3251	-0.5603	0.7618	2.702	2.704
5	60	-0.4134	-0.4177	0.8091	2.669	2.657
5	60	-0.4134	-0.4177	0.8091	3.457	3.459
5	70	-0.4891	-0.2623	0.8319	2.797	2.804
5	70	-0.4891	-0.2623	0.8319	3.280	3.280
5	80	-0.5500	-0.0990	0.8293	2.989	2.988
5	90	-0.5941	0.0673	0.8016	2.861	2.864
5	100	-0.6202	0.2316	0.7495	2.775	2.773
5	110	-0.6275	0.3888	0.6746	2.754	2.758
5	120	-0.6157	0.5343	0.5792	2.797	2.799
5	120	-0.6157	0.5343	0.5792	2.797	2.799
5	130	-0.5852	0.6635	0.4662	2.821	2.822
5	140	-0.5369	0.7725	0.3391	2.690	2.692
5	150	-0.4723	0.8581	0.2017	2.498	2.500
5	160	-0.3933	0.9176	0.0581	2.342	2.344
5	170	-0.3024	0.9492	-0.0872	2.288	2.284
5	180	-0.2023	0.9519	-0.2299	2.337	2.349
6	0	0.4526	-0.7562	0.4725	3.136	3.146
6	10	0.4863	-0.8161	0.3123	3.137	3.128
6	50	0.4699	-0.8008	-0.3714	2.865	2.868
6	50	0.4699	-0.8008	-0.3714	2.863	2.868
6	60	0.4286	-0.7339	-0.5270	2.857	2.871
6	70	0.3743	-0.6447	-0.6665	2.744	2.767
6	80	0.3086	-0.5359	-0.7858	2.650	2.655
6	90	0.2336	-0.4108	-0.8813	2.553	2.571
6	100	0.1514	-0.2733	-0.9499	2.524	2.534
6	110	0.0647	-0.1274	-0.9897	2.530	2.552
6	120	-0.0240	0.0223	-0.9995	2.531	2.535
6	120	-0.0240	0.0223	-0.9995	2.539	2.535
6	125	-0.0683	0.0972	-0.9929	2.437	2.428
6	130	-0.1120	0.1714	-0.9788	2.373	2.380

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6	135	-0.1549	0.2442	-0.9573	2.414	2.417
6	140	-0.1966	0.3152	-0.9284	2.536	2.523
6	140	-0.1966	0.3152	-0.9284	2.528	2.523
6	145	-0.2368	0.3838	-0.8925	2.663	2.660
6	150	-0.2752	0.4495	-0.8498	2.772	2.779
6	160	-0.3455	0.5701	-0.7454	2.927	2.949
6	170	-0.4052	0.6734	-0.6183	3.050	3.071
6	180	-0.4526	0.7562	-0.4725	3.118	3.146
7	0	-0.8505	-0.3771	-0.3666	2.721	2.714
7	0	-0.8505	-0.3771	-0.3666	2.720	2.714
7	10	-0.8992	-0.2106	-0.3835	2.764	2.756
7	20	-0.9206	-0.0377	-0.3887	2.884	2.889
7	40	-0.8796	0.3063	-0.3639	2.745	2.724
7	50	-0.8185	0.4669	-0.3347	2.695	2.691
7	60	-0.7326	0.6133	-0.2952	2.699	2.704
7	70	-0.6243	0.7411	-0.2469	2.695	2.701
7	80	-0.4972	0.8464	-0.1910	2.608	2.609
7	80	-0.4972	0.8464	-0.1910	3.553	3.538
7	90	-0.3549	0.9259	-0.1293	2.440	2.450
7	90	-0.3549	0.9259	-0.1293	3.550	3.570
7	95	-0.2794	0.9553	-0.0968	3.602	3.594
7	100	-0.2018	0.9774	-0.0636	3.605	3.620
7	130	0.2749	0.9517	0.1366	2.402	2.392
7	130	0.2749	0.9517	0.1366	3.609	3.588
7	140	0.4234	0.8841	0.1978	2.550	2.562
7	140	0.4234	0.8841	0.1978	3.573	3.552
7	150	0.5591	0.7896	0.2529	2.702	2.695
7	150	0.5591	0.7896	0.2529	3.561	3.544
7	155	0.6209	0.7331	0.2777	2.703	2.726
7	160	0.6778	0.6711	0.3003	2.741	2.733
7	165	0.7297	0.6039	0.3207	2.726	2.725
7	170	0.7760	0.5322	0.3386	2.708	2.713
7	180	0.8505	0.3771	0.3666	2.719	2.714
8	0	-0.8874	-0.0149	0.4607	2.852	2.834
8	5	-0.9035	0.0625	0.4239	2.828	2.820
8	15	-0.9151	0.2154	0.3409	2.767	2.769
8	20	-0.9104	0.2897	0.2954	2.735	2.723
8	25	-0.8988	0.3617	0.2476	2.685	2.666
8	30	-0.8804	0.4310	0.1979	2.613	2.612
8	35	-0.8552	0.4970	0.1467	2.579	2.575
8	40	-0.8236	0.5593	0.0944	2.557	2.560
8	50	-0.7418	0.6705	-0.0119	2.570	2.557
8	60	-0.6374	0.7614	-0.1179	2.541	2.526
8	70	-0.5137	0.8292	-0.2204	2.486	2.477
8	75	-0.4458	0.8537	-0.2692	2.464	2.458
8	85	-0.3002	0.8831	-0.3605	2.443	2.449
8	90	-0.2237	0.8878	-0.4022	2.444	2.462
8	100	-0.0662	0.8769	-0.4761	2.531	2.520
8	110	0.0933	0.8394	-0.5355	2.602	2.609
8	120	0.2500	0.7763	-0.5787	2.695	2.703
8	130	0.3991	0.6897	-0.6042	2.780	2.765
8	140	0.5360	0.5821	-0.6114	2.857	2.821
8	140	0.5360	0.5821	-0.6114	2.856	2.821
8	150	0.6567	0.4568	-0.6001	2.942	2.938
8	160	0.7574	0.3176	-0.5705	2.923	2.918
8	170	0.8351	0.1688	-0.5236	2.862	2.867
8	180	0.8874	0.0149	-0.4607	2.835	2.834
9	0	0.8328	0.3821	-0.4006	2.712	2.713
9	10	0.7654	0.5364	-0.3555	2.652	2.656
9	20	0.6748	0.6745	-0.2995	2.611	2.612
9	30	0.5637	0.7920	-0.2344	2.530	2.532
9	40	0.4355	0.8854	-0.1623	2.416	2.418
9	50	0.2941	0.9520	-0.0852	2.309	2.306
9	60	0.1437	0.9896	-0.0055	2.236	2.234
9	70	-0.0111	0.9972	0.0744	2.201	2.222
9	90	-0.3149	0.9221	0.2250	2.382	2.380
9	100	-0.4547	0.8417	0.2911	2.503	2.505
9	110	-0.5807	0.7358	0.3485	2.612	2.613
9	120	-0.6891	0.6075	0.3952	2.680	2.679
9	130	-0.7765	0.4607	0.4299	2.726	2.717
9	140	-0.8403	0.3000	0.4515	2.762	2.768
9	145	-0.8628	0.2159	0.4572	2.798	2.799
9	150	-0.8786	0.1301	0.4594	2.830	2.825
9	160	-0.8902	-0.0437	0.4534	2.851	2.839
9	170	-0.8748	-0.2162	0.4336	2.788	2.791
9	170	-0.8748	-0.2162	0.4336	2.790	2.791
9	180	-0.8328	-0.3821	0.4006	2.713	2.713

Sample: H003

Density (gm/cc) = 2.555

Number of crystals = 8

Number of measured velocities = 145

root-mean-square velocity misfit = 12 m/s

Euler Angles (Koch convention):

rotate cartesian coordinates of crystal into laboratory coordinates

first angle rotate about z, second angle rotate about y', third angle rotate about z''

Crystal	1	2	3	4	5	6	7	8
	179.8	-0.6	59.0	87.6	175.1	239.2	121.4	0.3
	240.0	69.2	105.1	85.4	2.7	281.7	-257.9	-31.7
	242.8	187.3	-150.6	206.4	9.7	3.8	-48.9	-177.4

Elastic Constants (GPa) and 2*sigma formal uncertainties

11	22	33	44	55	66	12	13	15	23	
67.8	181.2	158.4	21.1	19.4	33.1	40.4	25.0	-1.1	20.6	
0.6	3.5	4.0	0.1	0.1	0.2	1.0	1.0	0.2	3.9	
25	35	46	14	16	24	26	34	36	45	56
-12.9	10.6	-11.6								
0.6	0.7	0.2								

	Voigt		Ruess		Hill
Bulk Modulus	64.4	0.6	54.5	0.5	59.5
Shear Modulus	36.1	0.7	24.5	0.1	30.3

X-ray compliances (GPa⁻¹)*1e3 used in fitting:

11.85	2.41	4.11	0.00	0.00	0.00	Bulk Modulus (GPa)	54.4
0.06	0.03	0.05	-	0.02	-		0.2

Compliances from fit to velocities:

11.78	2.42	4.14	0.00	0.02	0.00
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crystal	lab angle	Direction cosines			Vmeasured	Vcalculated
1	0	-0.2254	0.8900	-0.3963	3.169	3.159
1	0	-0.2254	0.8900	-0.3963	3.153	3.159
1	0	-0.2254	0.8900	-0.3963	3.166	3.159
1	10	-0.1445	0.9557	-0.2566	3.437	3.430
1	10	-0.1445	0.9557	-0.2566	3.444	3.430
1	20	-0.0592	0.9923	-0.1091	3.513	3.519
1	50	0.1969	0.9214	0.3351	3.089	3.094
1	60	0.2737	0.8399	0.4687	3.118	3.135
1	70	0.3422	0.7328	0.5881	3.032	3.026
1	80	0.4003	0.6036	0.6895	2.916	2.908
1	90	0.4462	0.4559	0.7701	2.809	2.807
1	100	0.4786	0.2945	0.8272	2.734	2.735
1	105	0.4893	0.2101	0.8464	2.709	2.706
1	115	0.4997	0.0371	0.8654	2.755	2.747
1	130	0.4867	-0.2228	0.8447	2.697	2.711
1	140	0.4595	-0.3887	0.7986	2.772	2.769
1	150	0.4183	-0.5428	0.7283	2.868	2.858
1	160	0.3644	-0.6804	0.6358	2.977	2.972
1	170	0.2995	-0.7973	0.5240	3.083	3.090
1	180	0.2254	-0.8900	0.3963	3.146	3.159
2	0	-0.3531	-0.1233	0.9274	2.708	2.697
2	0	-0.3531	-0.1233	0.9274	2.700	2.697
2	5	-0.3488	-0.2094	0.9135	2.611	2.621
2	20	-0.3200	-0.4553	0.8308	2.591	2.601
2	30	-0.2885	-0.6030	0.7437	2.709	2.721
2	40	-0.2483	-0.7323	0.6341	2.836	2.862
2	50	-0.2005	-0.8394	0.5051	2.900	2.904
2	60	-0.1466	-0.9210	0.3608	2.714	2.724
2	80	-0.0273	-0.9987	0.0440	2.340	2.341
2	80	-0.0273	-0.9987	0.0440	2.342	2.341
2	80	-0.0273	-0.9987	0.0440	3.776	3.787
2	90	0.0346	-0.9923	-0.1188	2.386	2.384
2	90	0.0346	-0.9923	-0.1188	3.771	3.784
2	100	0.0954	-0.9558	-0.2780	2.571	2.585
2	100	0.0954	-0.9558	-0.2780	2.581	2.585
2	110	0.1533	-0.8903	-0.4288	2.825	2.830
2	120	0.2065	-0.7977	-0.5666	2.884	2.913
2	130	0.2535	-0.6809	-0.6871	2.783	2.807
2	140	0.2928	-0.5434	-0.7868	2.664	2.662
2	140	0.2928	-0.5434	-0.7868	2.662	2.662
2	150	0.3231	-0.3893	-0.8626	2.577	2.574
2	160	0.3437	-0.2235	-0.9121	2.621	2.613
2	160	0.3437	-0.2235	-0.9121	3.535	3.545
2	170	0.3538	-0.0508	-0.9339	2.770	2.780
2	175	0.3548	0.0364	-0.9342	2.788	2.786
2	180	0.3531	0.1233	-0.9274	2.695	2.697

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2	180	0.3531	0.1233	-0.9274	2.687	2.697
3	0	0.5374	-0.0584	0.8413	2.341	2.344
3	10	0.6476	-0.1544	0.7462	2.464	2.470
3	20	0.7381	-0.2456	0.6284	2.681	2.676
3	30	0.8062	-0.3293	0.4916	2.845	2.861
3	40	0.8498	-0.4031	0.3398	2.944	2.945
3	50	0.8675	-0.4646	0.1776	2.818	2.823
3	60	0.8589	-0.5120	0.0101	3.421	3.428
3	70	0.8242	-0.5438	-0.1577	3.336	3.335
3	80	0.7645	-0.5591	-0.3208	3.247	3.252
3	90	0.6815	-0.5575	-0.4741	3.041	3.046
3	100	0.5779	-0.5388	-0.6130	2.932	2.933
3	110	0.4566	-0.5039	-0.7332	2.790	2.789
3	120	0.3215	-0.4536	-0.8312	2.647	2.657
3	130	0.1767	-0.3895	-0.9039	2.550	2.561
3	140	0.0264	-0.3136	-0.9492	2.531	2.521
3	170	-0.4109	-0.0393	-0.9108	2.387	2.381
3	180	-0.5374	0.0584	-0.8413	2.345	2.344
4	0	0.4407	-0.0900	0.8931	2.352	2.355
4	10	0.5897	-0.0889	0.8027	2.340	2.347
4	20	0.7208	-0.0851	0.6879	2.445	2.447
4	30	0.8300	-0.0787	0.5522	2.627	2.619
4	40	0.9140	-0.0700	0.3997	2.836	2.810
4	100	0.8066	0.0141	-0.5910	3.377	3.360
4	110	0.6919	0.0293	-0.7214	3.263	3.234
4	120	0.5563	0.0436	-0.8299	3.066	3.063
4	130	0.4037	0.0566	-0.9131	2.882	2.870
4	140	0.2388	0.0679	-0.9687	2.672	2.690
4	145	0.1534	0.0728	-0.9855	2.629	2.621
4	155	-0.0204	0.0809	-0.9965	2.574	2.556
4	160	-0.1074	0.0840	-0.9907	2.569	2.559
4	170	-0.2783	0.0884	-0.9564	2.466	2.469
4	180	-0.4407	0.0900	-0.8931	2.355	2.355
6	0	-0.9954	-0.0829	-0.0470	2.634	2.624
6	10	-0.9660	-0.2547	-0.0449	2.561	2.556
6	30	-0.8208	-0.5701	-0.0367	2.542	2.544
6	40	-0.7095	-0.7041	-0.0309	2.577	2.580
6	50	-0.5766	-0.8167	-0.0241	2.583	2.559
6	60	-0.4262	-0.9045	-0.0166	2.471	2.482
6	70	-0.2628	-0.9648	-0.0085	2.389	2.398
6	80	-0.0915	-0.9958	-0.0003	2.337	2.346
6	100	0.2542	-0.9670	0.0161	2.400	2.396
6	110	0.4181	-0.9081	0.0236	2.486	2.480
6	110	0.4181	-0.9081	0.0236	3.702	3.683
6	130	0.7031	-0.7101	0.0364	2.574	2.583
6	140	0.8157	-0.5771	0.0412	2.538	2.548
6	150	0.9034	-0.4265	0.0447	2.516	2.519
6	160	0.9637	-0.2629	0.0469	2.549	2.554
6	170	0.9947	-0.0914	0.0477	2.624	2.622
6	180	0.9954	0.0829	0.0470	2.625	2.624
7	0	-0.0458	-0.2077	0.9771	2.710	2.712
7	10	0.1050	-0.2912	0.9509	2.579	2.588
7	40	0.5205	-0.4797	0.7064	2.694	2.697
7	50	0.6326	-0.5156	0.5779	2.838	2.839
7	60	0.7256	-0.5358	0.4318	2.963	2.960
7	70	0.7965	-0.5398	0.2726	2.997	3.004
7	110	0.8278	-0.3977	-0.3958	3.053	3.054
7	120	0.7713	-0.3281	-0.5453	3.050	3.044
7	130	0.6915	-0.2486	-0.6783	2.950	2.954
7	140	0.5906	-0.1615	-0.7907	2.856	2.854
7	150	0.4717	-0.0695	-0.8790	2.755	2.765
7	160	0.3386	0.0246	-0.9406	2.715	2.706
7	170	0.1951	0.1180	-0.9737	2.682	2.687
7	180	0.0458	0.2077	-0.9771	2.717	2.712
8	0	0.7152	0.2745	-0.6428	2.963	2.977
8	10	0.6211	0.1875	-0.7609	2.888	2.879
8	20	0.5082	0.0948	-0.8560	2.796	2.787
8	30	0.3798	-0.0008	-0.9251	2.724	2.721
8	70	-0.2056	-0.3543	-0.9122	2.564	2.570
8	70	-0.2056	-0.3543	-0.9122	2.579	2.570
8	70	-0.2056	-0.3543	-0.9122	2.554	2.570
8	80	-0.3477	-0.4220	-0.8373	2.568	2.578
8	80	-0.3477	-0.4220	-0.8373	2.564	2.578
8	90	-0.4792	-0.4769	-0.7368	2.667	2.675
8	100	-0.5961	-0.5174	-0.6140	2.823	2.812
8	110	-0.6949	-0.5421	-0.4726	2.957	2.940
8	120	-0.7726	-0.5503	-0.3167	3.004	3.012
8	125	-0.8027	-0.5481	-0.2349	2.992	2.991
8	130	-0.8268	-0.5418	-0.1513	2.888	2.883
8	130	-0.8268	-0.5418	-0.1513	2.867	2.883
8	135	-0.8445	-0.5313	-0.0665	2.725	2.720
8	170	-0.7875	-0.3531	0.5050	3.061	3.056
8	180	-0.7152	-0.2745	0.6428	2.971	2.977
9	10	-0.8291	-0.2222	-0.5131	2.778	2.824

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9	20	-0.7835	-0.3881	-0.4853	2.860	2.848
9	30	-0.7140	-0.5423	-0.4429	2.871	2.843
9	40	-0.6229	-0.6799	-0.3869	2.844	2.857
9	50	-0.5128	-0.7969	-0.3192	2.840	2.832
9	60	-0.3872	-0.8897	-0.2418	3.516	3.484
9	60	-0.3872	-0.8897	-0.2418	2.659	2.705
9	100	0.1903	-0.9750	0.1148	3.517	3.542
9	110	0.3313	-0.9216	0.2022	3.500	3.495
9	120	0.4623	-0.8402	0.2834	2.785	2.786
9	125	0.5228	-0.7897	0.3209	2.815	2.833
9	140	0.6787	-0.6041	0.4177	2.819	2.845
9	145	0.7208	-0.5323	0.4440	2.853	2.839
9	150	0.7574	-0.4565	0.4668	2.845	2.840
9	160	0.8131	-0.2951	0.5017	2.869	2.854
9	180	0.8495	0.0495	0.5252	3.075	3.052