Supplemental Material: Quenching of excited rovibrational states of H_2^+ in an external magnetic field

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The two-photon matrix elements Q_s, Q_v, and Q_t defined in Eqs. (21-23), in atomic units (that is $(ea_0)^2/E_h = 4\pi\epsilon_0 a_0^3$) where a_0 is the Bohr radius and E_h the Hartree energy), are given in the following Tables for $L \to L' = L-2$ ($\Delta v = v - v' = 0, 1, 2$, Tables I-III) , $L \to L' = L$ ($\Delta v = 1, 2$, Tables IV-V), and $L \to L' = L+2$ transitions ($\Delta v = 1, 2$, Tables VI-VII).

It is worth noting that for $L \to L$ transitions, the rank 1 component Q_v is comparatively small and may safely be ignored for calculating decay rates at the 4-digit accuracy level.

TABLE I: Two-photon matrix elements Q_t in atomic units, with $L' = L - 2$ and $v' = v$.

L/v	0	1	2	3	4	5	6	7	8	9	10	11	12
2	2.6840	3.8218	5.3437	7.3899	10.163	13.962	19.240	26.705	37.504	53.572	78.347	118.33	186.85
3	2.0986	2.9873	4.1762	5.7752	7.9431	10.915	15.047	20.896	29.368	41.992	61.494	93.049	
4	1.9704	2.8034	3.9182	5.4183	7.4535	10.246	14.132	19.643	27.637	39.578	58.077	88.125	
5	1.9316	2.7466	3.8376	5.3068	7.3018	10.042	13.863	19.290	27.182	39.006	57.398		
6	1.9313	2.7440	3.8328	5.3003	7.2954	10.040	13.874	19.333	27.297	39.275	58.000		
7	1.9542	2.7744	3.8740	5.3575	7.3776	10.162	14.060	19.628	27.780	40.101			
8	1.9946	2.8292	3.9493	5.4626	7.5267	10.378	14.382	20.120	28.562	41.393			
9	2.0498	2.9050	4.0540	5.6089	7.7341	10.678	14.825	20.794	29.622				
10	2.1189	3.0003	4.1862	5.7940	7.9970	11.058	15.387	21.649	30.967				
11	2.2015	3.1148	4.3457	6.0180	8.3159	11.520	16.072	22.694					
12	2.2979	3.2490	4.5332	6.2824	8.6937	12.070	16.891	23.951					
13	2.4088	3.4039	4.7504	6.5899	9.1351	12.715	17.858						
14	2.5350	3.5808	4.9996	6.9444	9.6465	13.468	18.994						
15	2.6777	3.7817	5.2839	7.3506	10.236	14.341							
16	2.8383	4.0088	5.6069	7.8149	10.914	15.354							
17	3.0185	4.2649	5.9730	8.3445	11.694	16.528							
18	3.2205	4.5534	6.3878	8.9488	12.590								
19	3.4465	4.8780	6.8578	9.6387	13.624								
20	3.6993	5.2435	7.3908	10.428									
21	3.9823	5.6554	7.9965	11.334									
22	4.2993	6.1203	8.6862										
23	4.6548	6.6462	9.4744										
24	5.0544	7.2428											
25	5.5043	7.9218											
26	6.0124												
27	6.5880												

TABLE II: Same as Table I, with $v' = v - 1$.

L/v	1	2	3	4	5	6	7	8	9	10	11	12
2	1.1077	1.9670	3.0372	4.4466	6.3497	8.9678	12.636	17.884	25.581	37.225	55.541	85.847
3	0.83969	1.4893	2.2973	3.3606	4.7959	6.7703	9.5370	13.496	19.307	28.103	41.956	
4	0.76393	1.3533	2.0856	3.0487	4.3487	6.1374	8.6453	12.237	17.514	25.517	38.147	
5	0.72540	1.2836	1.9764	2.8874	4.1172	5.8104	8.1865	11.594	16.610	24.235		
6	0.70238	1.2415	1.9101	2.7892	3.9765	5.6127	7.9121	11.216	16.092	23.527		
7	0.68829	1.2153	1.8686	2.7276	3.8889	5.4911	7.7471	10.997	15.807			
8	0.68043	1.2003	1.8445	2.6920	3.8389	5.4241	7.6612	10.893	15.697			
9	0.67750	1.1942	1.8343	2.6771	3.8193	5.4014	7.6405	10.887				
10	0.67883	1.1957	1.8362	2.6804	3.8267	5.4184	7.6787	10.971				
11	0.68407	1.2043	1.8493	2.7007	3.8592	5.4729	7.7734					
12	0.69306	1.2197	1.8732	2.7374	3.9165	5.5647	7.9250					
13	0.70576	1.2419	1.9080	2.7908	3.9990	5.6948						
14	0.72223	1.2710	1.9538	2.8613	4.1078	5.8655						
15	0.74260	1.3072	2.0113	2.9500	4.2447							
16	0.76710	1.3511	2.0813	3.0582	4.4121							
17	0.79600	1.4032	2.1647	3.1878	4.6132							
18	0.82967	1.4642	2.2629	3.3411								
19	0.86856	1.5350	2.3775	3.5209								
20	0.91319	1.6167	2.5105									
21	0.96423	1.7107	2.6643									
22	1.0225	1.8186										
23	1.0888	1.9423										
24	1.1644											
25	1.2507											

TABLE III: Same as Table I, with $v' = v - 2$.

L/v	2	3	4	5	6	7	8	9	10	11	12
2	0.11149	0.23388	0.40416	0.64377	0.98330	1.4686	2.1704	3.2013	4.7471	7.1302	10.946
3	0.07752	0.16263	0.28110	0.44791	0.68441	1.0226	1.5116	2.2296	3.3057	4.9630	
4	0.06428	0.13492	0.23337	0.37214	0.56908	0.85087	1.2586	1.8572	2.7541	4.1349	
5	0.05525	0.11610	0.20104	0.32098	0.49144	0.73564	1.0892	1.6086	2.3868		
6	0.04807	0.10116	0.17547	0.28066	0.43045	0.64536	0.95687	1.4147	2.1008		
7	0.04196	0.08852	0.15392	0.24676	0.37933	0.56989	0.84645	1.2532			
8	0.03660	0.07745	0.13512	0.21730	0.33499	0.50456	0.75098	1.1136			
9	0.03179	0.06757	0.11837	0.19113	0.29570	0.44672	0.66645				
10	0.02740	0.05860	0.10323	0.16751	0.26028	0.39458	0.59011				
11	0.02336	0.05035	0.08934	0.14589	0.22785	0.34676					
12	0.01959	0.04267	0.07643	0.12580	0.19769	0.30212					
13	0.01602	0.03543	0.06427	0.10685	0.16914						
14	0.01261	0.02851	0.05264	0.08867	0.14158						
15	0.00929	0.02179	0.04132	0.07089							
16	0.00604	0.01517	0.03010	0.05312							
17	0.00278	0.00852	0.01877	0.03495							
18	0.00053	0.00173	0.00706								
19	0.00395	0.00536	0.00532								
20	0.00754	0.01290									
21	0.01139	0.02109									
22	0.01558										
23	0.02023										

TABLE IV: Two-photon matrix elements Q_s (first line) Q_v (second line) and Q_t (third line) in atomic units, with $L' = L$ and $v' = v - 1$.

L/v	1	2	3	4	5	6	7	8	9	10	11	12
0	-0.83797	-1.4013	-2.0514	-2.8653	-3.9272	-5.3537	-7.3199	-10.102	-14.153	-20.255	-29.827	-45.641
1	-0.84102	-1.4067	-2.0598	-2.8778	-3.9456	-5.3805	-7.3596	-10.162	-14.245	-20.401	-30.070	-46.067
1	0.00004	0.00009	0.00016	0.00028	0.00047	0.00079	0.00134	0.00233	0.00415	0.00772	0.01520	0.03240
1	0.73131	1.3010	2.0122	2.9502	4.2184	5.9648	8.4139	11.920	17.068	24.861	37.131	57.453
2	-0.84714	-1.4175	-2.0766	-2.9029	-3.9824	-5.4346	-7.4397	-10.282	-14.431	-20.697	-30.562	-46.933
2	0.00008	0.00016	0.00029	0.00049	0.00083	0.00140	0.00237	0.00411	0.00734	0.01369	0.02708	0.05797
2	0.62401	1.1104	1.7178	2.5194	3.6038	5.0984	7.1964	10.204	14.624	21.329	31.910	49.487
3	-0.85639	-1.4339	-2.1020	-2.9409	-4.0383	-5.5167	-7.5615	-10.466	-14.715	-21.150	-31.317	
3	0.00011	0.00023	0.00041	0.00071	0.00120	0.00202	0.00345	0.00598	0.01073	0.02009	0.03993	
3	0.61153	1.0885	1.6846	2.4719	3.5382	5.0095	7.0777	10.048	14.423	21.076	31.612	
4	-0.86884	-1.4560	-2.1365	-2.9922	-4.1139	-5.6281	-7.7270	-10.716	-15.103	-21.771	-32.358	
4	0.00015	0.00030	0.00055	0.00095	0.00160	0.00270	0.00461	0.00804	0.01447	0.02724	0.05454	
4	0.61508	1.0953	1.6960	2.4903	3.5676	5.0564	7.1534	10.172	14.631	21.437	32.266	
5	-0.88459	-1.4839	-2.1801	-3.0575	-4.2102	-5.7702	-7.9389	-11.038	-15.603	-22.577		
5	0.00019	0.00039	0.00070	0.00120	0.00204	0.00345	0.00590	0.01034	0.01871	0.03548		
5	0.62567	1.1147	1.7273	2.5385	3.6405	5.1666	7.3214	10.432	15.045	22.119		
6	-0.90379	-1.5181	-2.2335	-3.1376	-4.3286	-5.9455	-8.2009	-11.437	-16.227	-23.588		
6	0.00023	0.00047	0.00086	0.00148	0.00252	0.00428	0.00737	0.01297	0.02364	0.04522		
6	0.64111	1.1429	1.7725	2.6077	3.7446	5.3231	7.5586	10.798	15.623	23.064		
7	-0.92659	-1.5587	-2.2972	-3.2333	-4.4706	-6.1565	-8.5178	-11.922	-16.990			
7	0.00027	0.00057	0.00104	0.00180	0.00307	0.00524	0.00906	0.01605	0.02948			
7	0.66071	1.1788	1.8300	2.6956	3.8769	5.5219	7.8599	11.262	16.358			
8	-0.95322	-1.6063	-2.3719	-3.3460	-4.6384	-6.4067	-8.8953	-12.503	-17.910			
8	0.00033	0.00068	0.00124	0.00216	0.00370	0.00634	0.01103	0.01969	0.03653			
8	0.68435	1.2221	1.8994	2.8020	4.0373	5.7635	8.2273	11.831	17.263			
9	-0.98391	-1.6612	-2.4586	-3.4771	-4.8344	-6.7004	-9.3409	-13.193				
9	0.00038	0.00081	0.00147	0.00257	0.00443	0.00763	0.01337	0.02407				
9	0.71209	1.2730	1.9812	2.9276	4.2273	6.0508	8.6659	12.514				
10	-1.0190	-1.7242	-2.5582	-3.6285	-5.0617	-7.0427	-9.8637	-14.010				
10	0.00045	0.00095	0.00174	0.00305	0.00527	0.00916	0.01617	0.02941				
10	0.74414	1.3319	2.0761	3.0740	4.4495	6.3882	9.1841	13.327				
11	-1.0587	-1.7959	-2.6721	-3.8023	-5.3239	-7.4402	-10.475					
11	0.00053	0.00111	0.00205	0.00361	0.00627	0.01097	0.01955					
11	0.78083	1.3995	2.1854	3.2430	4.7073	6.7818	9.7926					
12	-1.1036	-1.8772	-2.8017	-4.0010	-5.6257	-7.9007	-11.189					
12	0.00061	0.00130	0.00240	0.00426	0.00746	0.01316	0.02370					
12	0.82254	1.4767	2.3105	3.4373	5.0051	7.2394	10.505					
13	-1.1541	-1.9690	-2.9489	-4.2280	-5.9724	-8.4340						
13	0.00071	0.00152	0.00282	0.00503	0.00888	0.01582						
13	0.86974	1.5642	2.4532	3.6600	5.3484	7.7705						
14	-1.2108	-2.0724	-3.1156	-4.4868	-6.3709	-9.0520						
14	0.00083	0.00177	0.00331	0.00595	0.01060	0.01907						
14	0.92301	1.6634	2.6155	3.9148	5.7438	8.3873						
15	-1.2742	-2.1890	-3.3046	-4.7821	-6.8291							
15	0.00096	0.00207	0.00389	0.00705	0.01268							
15	0.98302	1.7757	2.8001	4.2063	6.1996							
16	-1.3453	-2.3203	-3.5189	-5.1195	-7.3575							
16	0.00112	0.00242	0.00459	0.00838	0.01523							
16	1.0506	1.9027	3.0101	4.5402	6.7259							
17	-1.4250	-2.4683	-3.7622	-5.5058	-7.9684							
17	0.00130	0.00283	0.00542	0.00999	0.01838							
17	1.1266	2.0463	3.2492	4.9233	7.3357							
18	-1.5142	-2.6353	-4.0388	-5.9492								
18	0.00151	0.00332	0.00641	0.01196								
18	1.2122	2.2090	3.5219	5.3640								
19	-1.6143	-2.8240	-4.3544	-6.4603								
19	0.00177	0.00391	0.00762	0.01438								
19	1.3087	2.3935	3.8337	5.8729								
20	-1.7269	-3.0380	-4.7155									

(continued on next page)

TABLE IV (continued)

L/v	1	2	3	4	5	6	7	8	9	10	11	12
20	0.00206	0.00461	0.00909									
20	1.4176	2.6034	4.1915									
21	-1.8537	-3.2813	-5.1305									
21	0.00242	0.00546	0.01090									
21	1.5408	2.8428	4.6036									
22	-1.9969	-3.5588										
22	0.00284	0.00648										
22	1.6806	3.1168										
23	-2.1593	-3.8770										
23	0.00335	0.00774										
23	1.8396	3.4316										
24	-2.3441											
24	0.00397											
24	2.0211											
25	-2.5553											
25	0.00471											
25	2.2293											

TABLE V: Same as Table IV, with $v' = v - 2$.

L/v	2	3	4	5	6	7	8	9	10	11	12
0	-0.03562	-0.08270	-0.15560	-0.26641	-0.43284	-0.68172	-1.0547	-1.6186	-2.4838	-3.8426	-6.0497
1	-0.03587	-0.08328	-0.15668	-0.26825	-0.43585	-0.68654	-1.0624	-1.6308	-2.5035	-3.8751	-6.1053
1	0.00003	0.00006	0.00012	0.00023	0.00041	0.00073	0.00131	0.00240	0.00453	0.00895	0.01885
1	0.08291	0.17403	0.30084	0.47932	0.73230	1.0941	1.6179	2.3884	3.5465	5.3373	8.2150
2	-0.03639	-0.08444	-0.15884	-0.27195	-0.44191	-0.69626	-1.0779	-1.6554	-2.5433	-3.9410	-6.2183
2	0.00005	0.00011	0.00022	0.00040	0.00072	0.00129	0.00232	0.00425	0.00804	0.01592	0.03367
2	0.07078	0.14860	0.25698	0.40961	0.62610	0.93596	1.3849	2.0461	3.0412	4.5827	7.0652
3	-0.03717	-0.08621	-0.16213	-0.27758	-0.45113	-0.71106	-1.1014	-1.6931	-2.6042	-4.0419	
3	0.00007	0.00016	0.00031	0.00058	0.00105	0.00188	0.00338	0.00621	0.01179	0.02346	
3	0.06941	0.14579	0.25226	0.40233	0.61542	0.92077	1.3638	2.0173	3.0029	4.5335	
4	-0.03824	-0.08862	-0.16660	-0.28522	-0.46367	-0.73121	-1.1336	-1.7445	-2.6876	-4.1805	
4	0.00009	0.00021	0.00042	0.00078	0.00140	0.00251	0.00454	0.00837	0.01597	0.03197	
4	0.06987	0.14687	0.25430	0.40593	0.62152	0.93093	1.3807	2.0456	3.0511	4.6182	
5	-0.03960	-0.09169	-0.17232	-0.29501	-0.47975	-0.75708	-1.1749	-1.8108	-2.7955		
5	0.00011	0.00026	0.00053	0.00099	0.00179	0.00322	0.00584	0.01082	0.02077		
5	0.07116	0.14969	0.25944	0.41455	0.63549	0.95320	1.4161	2.1024	3.1438		
6	-0.04128	-0.09549	-0.17938	-0.30711	-0.49965	-0.78915	-1.2263	-1.8935	-2.9305		
6	0.00013	0.00033	0.00065	0.00123	0.00223	0.00402	0.00733	0.01367	0.02642		
6	0.07302	0.15377	0.26679	0.42684	0.65527	0.98456	1.4657	2.1814	3.2722		
7	-0.04330	-0.10007	-0.18790	-0.32173	-0.52373	-0.82805	-1.2888	-1.9944			
7	0.00016	0.00040	0.00080	0.00149	0.00273	0.00495	0.00907	0.01703			
7	0.07540	0.15895	0.27613	0.44244	0.68039	1.0244	1.5287	2.2819			
8	-0.04569	-0.10550	-0.19802	-0.33912	-0.55243	-0.87454	-1.3637	-2.1159			
8	0.00019	0.00047	0.00096	0.00180	0.00331	0.00603	0.01113	0.02107			
8	0.07827	0.16522	0.28746	0.46138	0.71093	1.0729	1.6056	2.4051			
9	-0.04851	-0.11187	-0.20991	-0.35959	-0.58630	-0.92957	-1.4527				
9	0.00023	0.00056	0.00114	0.00216	0.00399	0.00732	0.01360				
9	0.08167	0.17264	0.30087	0.48385	0.74725	1.1307	1.6977				
10	-0.05178	-0.11929	-0.22378	-0.38352	-0.62600	-0.99430	-1.5580				
10	0.00027	0.00067	0.00136	0.00258	0.00479	0.00885	0.01661				
10	0.08561	0.18129	0.31655	-0.51017	0.78993	1.1990	1.8068				
11	-0.05556	-0.12789	-0.23988	-0.41135	-0.67233	-1.0702					
11	0.00032	0.00079	0.00161	0.00308	0.00575	0.01072					
11	0.09017	0.19128	0.33470	0.54077	0.83972	1.2790					
12	-0.05992	-0.13780	-0.25849	-0.44363	-0.72627	-1.1589					
12	0.00038	0.00093	0.00191	0.00367	0.00691	0.01299					
12	0.09539	0.20277	0.35564	0.57616	0.89757	1.3724					
13	-0.06492	-0.14922	-0.27997	-0.48101	-0.78899						
13	0.00044	0.00109	0.00226	0.00438	0.00831						
13	0.10135	0.21592	0.37969	0.61699	0.96465						
14	-0.07067	-0.16234	-0.30473	-0.52427	-0.86194						
14	0.00052	0.00129	0.00268	0.00524	0.01003						
14	0.10813	0.23095	0.40728	0.66405	1.0424						
15	-0.07725	-0.17742	-0.33328	-0.57436							
15	0.00061	0.00152	0.00319	0.00629							
15	0.11586	0.24811	0.43892	0.71831							
16	-0.08478	-0.19474	-0.36621	-0.63243							
16	0.00071	0.00180	0.00380	0.00757							
16	0.12464	0.26771	0.47523	0.78091							
17	-0.09342	-0.21466	-0.40425	-0.69990							
17	0.00084	0.00213	0.00455	0.00915							
17	0.13462	0.29010	0.51692								
18	-0.10333	-0.23760	-0.44828								
18	0.00099	0.00254	0.00546								
18	0.14599	0.31571	0.56491								
19	-0.11471	-0.26407	-0.49938								
19	0.00117	0.00303	0.00659								
19	0.15895	0.34506	0.62028								
20	-0.12780	-0.29469									
20	0.00139	0.00363									

(continued on next page)

TABLE VI: Two-photon matrix elements Q_t in atomic units, with $L' = L + 2$ and $v' = v - 1$. Stars indicate cases where the $(v-1, L+2)$ level lies above the (v, L) level. In these cases, the "reversed" matrix element $\frac{\langle vL||Q^{(2)}||v-1L+2\rangle}{\sqrt{2L+5}} = \sqrt{\frac{2L+5}{2L+1}}\frac{\langle v-1L+2||Q^{(2)}||vL\rangle}{\sqrt{2L+1}}$ is given instead.

L/v	1	2	3	4	5	6	7	8	9	10	11	12
0	0.54126	0.96458	1.4942	2.1938	3.1409	4.4468	6.2804	8.9088	12.772	18.631	27.872	43.213
1	0.63690	1.1363	1.7622	2.5902	3.7126	5.2622	7.4413	10.570	15.179	22.185	33.270	51.744
2	0.69918	1.2489	1.9390	2.8533	4.0948	5.8118	8.2309	11.713	16.854	24.697	37.156	58.034
3	0.75249	1.3456	2.0916	3.0818	4.4287	6.2955	8.9318	12.737	18.375	27.011	40.806	
4	0.80403	1.4394	2.2401	3.3050	4.7567	6.7735	9.6299	13.766	19.922	29.399	44.638	
5	0.85695	1.5359	2.3933	3.5361	5.0978	7.2736	10.365	14.861	21.584	32.000		
6	0.91303	1.6383	2.5562	3.7827	5.4636	7.8129	11.164	16.060	23.425	34.920		
7	0.97350	1.7489	2.7327	4.0507	5.8627	8.4048	12.047	17.398	25.501			
8	1.0394	1.8696	2.9257	4.3451	6.3032	9.0618	13.035	18.907	27.872			
9	1.1116	2.0022	3.1385	4.6706	6.7928	9.7968	14.148	20.627				
10	1.1911	2.1485	3.3740	5.0327	7.3404	10.624	15.413	22.601				
11	1.2789	2.3105	3.6359	5.4371	7.9557	11.562	16.859					
12	1.3761	2.4905	3.9279	5.8907	8.6503	12.628	18.522					
13	1.4840	2.6910	4.2547	6.4011	9.4380	13.849						
14	1.6039	2.9148	4.6215	6.9779	10.335	15.255						
15	1.7375	3.1653	5.0346	7.6322	11.362							
16	1.8867	3.4465	5.5013	8.3775	12.545							
17	2.0536	3.7631	6.0307	9.2306	13.913							
18	2.2409	4.1207	6.6335	10.212								
19	2.4516	4.5261	7.3231	11.348								
20	2.6895	4.9874	8.1161									
21	2.9589	5.5147	9.0331									
22	3.2651	6.1205										
23	3.7654*	7.1045*										
24	4.1766*											
25	4.6509*											

TABLE V (continued)

L/v	2	3	4	5	6	7	8	9	10	11	12
20	0.17375	0.37879									
21	-0.14290	0.33019									
21	0.00165	0.00437									
21	0.19069	0.41766									
22	-0.16036										
22	0.00198										
22	0.21013										
23	-0.18060										
23	0.00237										
23	0.23253										

TABLE VII: Same as Table VI, with $v' = v - 2$.

L/v	2	3	4	5	6	7	8	9	10	11	12
0	0.06830	0.14349	0.24824	0.39579	0.60510	0.90477	1.3392	1.9796	2.9447	4.4422	6.8591
1	0.08581	0.18045	0.31245	0.49859	0.76297	1.1420	1.6924	2.5056	3.7347	5.6488	8.7521
2	0.10014	0.21081	0.36541	0.58374	0.89434	1.3405	1.9898	2.9517	4.4107	6.6931	10.415
3	0.11409	0.24048	0.41737	0.66764	1.0244	1.5379	2.2874	3.4016	5.0986	7.7679	
4	0.12855	0.27133	0.47161	0.75556	1.1613	1.7469	2.6045	3.8845	5.8440	8.9460	
5	0.14396	0.30433	0.52981	0.85030	1.3095	1.9745	2.9520	4.4180	6.6755		
6	0.16062	0.34011	0.59317	0.95390	1.4724	2.2261	3.3389	5.0170	7.6191		
7	0.17879	0.37928	0.66277	1.0682	1.6531	2.5069	3.7740	5.6970			
8	0.19873	0.42238	0.73969	1.1951	1.8548	2.8226	4.2673	6.4756			
9	0.22068	0.47004	0.82511	1.3368	2.0814	3.1797	4.8303				
10	0.24496	0.52293	0.92035	1.4956	2.3371	3.5861	5.4773				
11	0.27189	0.58184	1.0270	1.6745	2.6272	4.0511					
12	0.30185	0.64768	1.1468	1.8768	2.9579	4.5864					
13	0.33527	0.72151	1.2819	2.1066	3.3369						
14	0.37269	0.80460	1.4349	2.3690	3.7737						
15	0.41469	0.89843	1.6090	2.6700							
16	0.46201	1.0048	1.8080	3.0173							
17	0.51550	1.1259	2.0364	3.4203							
18	0.57618	1.2644	2.3001								
19	0.64532	1.4235	2.6063								
20	0.72441	1.6073									
21	0.81532	1.8209									
22	0.92036										
23	1.0424										