Spectroscopic properties and spin-orbit coupling of electronic excited states of germanium dimer

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Content

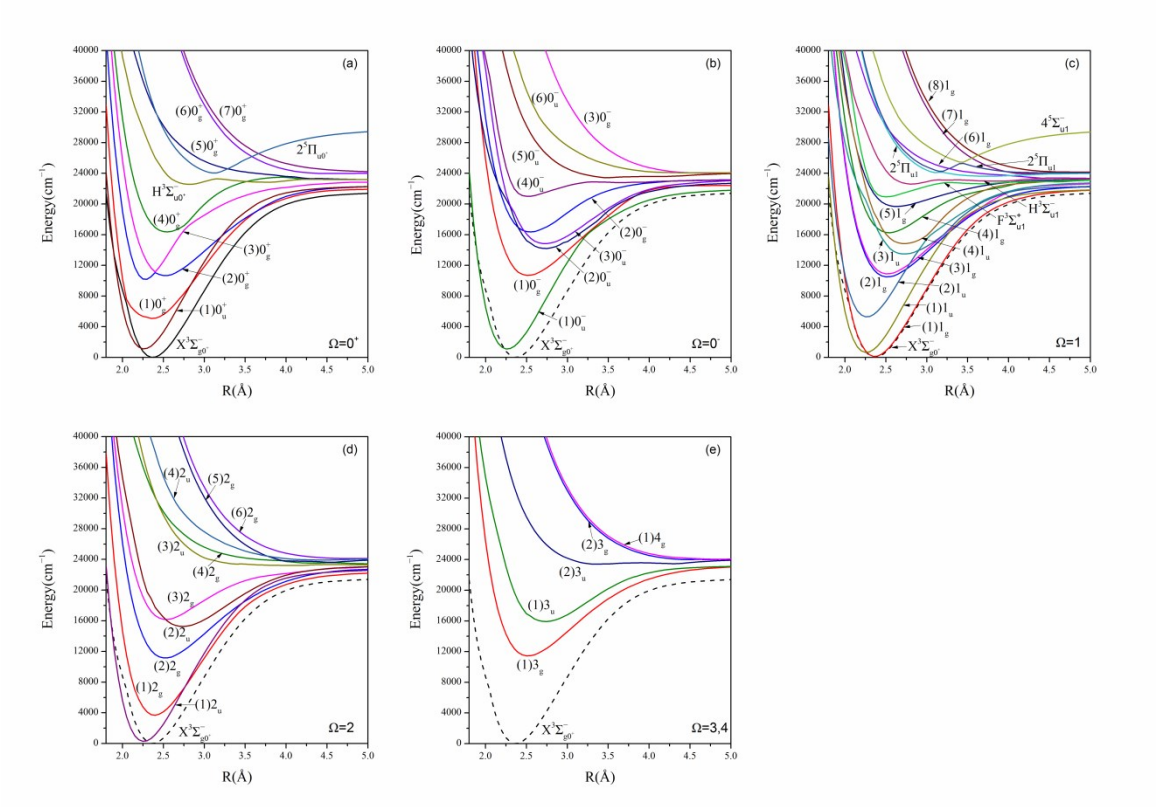

FIG. S1. Potential energy curves of Ge_2 for (a) $\Omega = 0^+$, (b) $\Omega = 0^-$, (c) $\Omega = 1$, (d) $\Omega = 2$, and (e) $\Omega = 3$ and 4 states. In all cases, the ground state is shown for comparison.

Table SI The raw data of PECs of the Λ-S states.

R	$X^3\Sigma_g^-$	$F^3\Sigma_u^-$	$H^3\Sigma_u^+$	$2^5\Pi_u$	$4^5\Sigma_u^-$			
1.8	32721.19988	53455.34978	57821.99516	79594.53419	74928.4305			
1.85	25052.54893	47895.15315	51495.55923	71073.39245	71188.68759			
1.9	18925.97689	43800.5062	46399.06794	64065.2068	66555.88827			
1.95	14007.49555	40893.94653	42294.79631	58195.13404	61942.50128			
2	10085.5759	38834.70509	39003.12412	53254.20155	57871.43888			
2.05	7004.914577	36469.65819	36355.26134	49070.56983	54235.74149			
2.1	4633.037632	32698.73549	34228.57644	45505.42724	50996.51205			
2.15	2857.726738	29332.92945	32489.18238	42445.71209	48113.19652			
2.2	1583.119179	26556.44635	30990.86875	39794.74988	45618.72279			
2.25	722.9452822	24339.66613	29602.63476	37490.79735	43351.32958			
2.3	221.497381	22701.76569	28245.49755	35489.70971	41312.92335			
2.35	14.2705	21641.66677	26963.63239	33742.86687	39487.48715			
2.4	51.23580444	21070.39043	25831.21835	32219.02238	37844.19344			
2.45	317.508411	20824.37425	24999.23142	30914.44084	36073.30978			
2.5	746.1728161	20757.96496	24168.72432	29777.56549	34566.95203			
2.55	1303.884397	20794.66375	23555.69068	28788.56923	33306.98672			
2.6	1961.180883	20896.57866	23100.71358	27929.62006	32254.6632			
2.65	2731.162141	21053.65026	22813.40193	27216.52031	31218.20176			
2.7	3540.745775	21217.20522	22603.09824	26581.95444	30432.20018			
2.75	4389.057779	21384.02609	22480.63033	26029.10265	29763.31325			
2.8	5265.953645	21551.40944	22435.4575	25548.64977	29177.54116			
2.85	6164.6678	21718.10541	22459.60186	25133.92995	28652.79433			
2.9	7076.470789	21880.99616	22543.10282	24776.92998	28178.96342			
2.95	7993.173165	22037.28516	22676.28439	24470.07451	27749.28436			
3	8907.096671	22184.92232	22850.31895	24206.65757	27357.89095			
3.05	9812.191232	22322.58011	23057.31426	23980.86604	27000.4474			
3.1	10702.84179	22449.52901	23290.27944	23787.69352	26672.8555			
3.15	11574.30966	22565.50604	23543.05654	23622.82999	26371.72547			
3.2	12422.51577	22670.58981	23810.22879	23482.54143	26094.23977			
3.25	13253.11266	22768.68976	24098.52175	23373.60225	25816.96715			
3.3	14044.24793	22852.68542	24379.92047	23272.13179	25582.7281			
3.35	14802.65092	22927.0743	24662.62016	23186.43951	25366.59305			
3.4	15526.03107	22992.55278	24943.38207	23114.43267	25167.10564			
3.45	16212.53206	23049.88392	25219.60581	23054.3797	24982.87535			
3.5	16860.66534	23099.83305	25489.22265	23004.79587	24812.65341			
3.55	17469.2755	23143.13049	25750.58656	22964.36858	24655.36192			
3.6	18037.5168	23180.45327	26002.40615	22931.92176	24510.0749			
3.65	18564.87375	23212.42544	26243.69931	22906.40399	24375.98225			
3.7	19051.18496	23239.61681	26473.7634	22886.87787	24252.36369			
3.75	19496.68082	23262.54465	26692.1392	22872.50775	24138.5591			
3.8	19902.01184	23281.67404	26898.58733	22862.55355	24033.95775			
3.85	20268.2815	23297.42585	27093.04837	22856.36085	23937.98445			
3.9	20597.03724	23310.17931	27275.62731	22853.35169	23850.09598			
3.95	20890.24955	23320.274	27446.55476	22853.0201	23769.77292			
4	21150.24632	23328.01317	27606.16231	22854.91756	23696.51634			
4.1	21581.17592	23337.50319	27893.13982	22863.89387	23569.31877			
4.2	21911.98266	23340.53908	28140.46919	22877.7269	23464.92623			
4.3	22164.23417	23338.66175	28352.48988	22894.49541	23380.06688			
4.4	22356.68026	23333.13521	28533.57686	22912.78342	23311.78541			
4.5	22504.37438	23324.98384	28687.89661	22931.56729	23257.44087			
4.6	22618.79386	23315.03029	28819.26603	22950.12694	23214.70134			
4.7	22708.43112	23303.92743	28931.09183	22967.97991	23181.53845			
4.8	22779.4728	23292.17749	29026.34827	22984.81767	23156.20308			
4.9	22836.41228	23280.15998	29107.60265	23000.46263	23137.20605			
5	22882.52379	23268.15627	29177.04629	23014.83346	23123.29401			
5.1	22920.21511	23256.37011	29236.53474	23027.91586	23113.42123			
5.2	22951.27594	23244.93995	29287.63214	23039.74068	23106.72249			
5.3	22977.05657	23233.96123	29331.65388	23050.36909	23102.49018			
5.4	22998.58728	23223.49121	29369.69992	23059.87872	23100.14786			
5.5	23016.66543	23213.56317	29402.69067	23068.35645	23099.23083			
5.6	23031.92022	23204.1909	29431.40072	23075.89507	23099.37055			
5.7	23044.84348	23195.37223	29456.47159	23082.58076	23100.26973			
5.8	23055.83869	23187.09961	29478.44685	23088.50393	23101.70229			
5.9	23065.22455	23179.35394	29497.7774	23093.7431	23103.48714			
6	23073.26269	23172.11263	29514.85045	23098.37254	23105.48698			
7	23113.20316	23122.17861	29615.22702	23123.48868	23124.48739			
8	23125.00645	23098.71031	29655.78516	23131.56978	23134.0999			
9	23129.06245	23087.72307	29654.58744	23134.61468	23137.85268			
10	23130.68574	23083.08145	29648.84986	23135.93298	23139.42207			

Table SII The raw data of PECs of the Ω states.

R	$X^3\Sigma^-_{g0+}$	$H^3\Sigma^-_{u0+}$	$2^5\Pi_{u0+}$	$F^3\Sigma^+_{u0-}$	$2^5\Pi_{u0-}$	$F^3\Sigma^+_{u1}$	$H^3\Sigma^-_{u1}$	$2^5\Pi_{u1}(\|\Sigma\|=0)$	$2^5\Pi_{u1}(\|\Sigma\|=2)$	$4^5\Sigma^-_{u1}$	
1.8	21338.32837	58014.90857	75110.22144	57430.00258	79538.90118	53748.36383	58170.05031	79303.24607	79781.17351	80018.21299	
1.85	16771.18068	51688.31582	71017.19324	51096.11054	71312.37808	48089.13244	51833.68067	71180.22571	71467.84442	71556.13922	
1.9	13261.7095	46591.69335	64009.22138	45873.88987	64482.36786	43839.08511	46783.27348	64241.97239	64725.71324	66749.57538	
1.95	10654.48899	42487.28777	58140.10079	41473.03337	58613.37984	40872.67093	42744.40416	58374.45384	58853.8543	62132.63837	
2	8770.428142	39195.4498	53200.75177	39024.28301	53671.88545	38596.43805	39674.78327	53434.79036	53910.05116	58060.07612	
2.05	7005.732826	36835.12709	49019.41983	36547.3576	49486.93445	36253.46004	37172.71178	49252.25639	49722.66472	54423.55776	
2.1	4675.229183	34402.12169	45467.64521	33061.03338	45931.45736	32869.1327	34426.70227	45691.87382	46164.63861	51183.41573	
2.15	2904.732672	32664.52623	42407.87339	29742.79679	42861.85024	29500.37388	32695.06493	42626.9201	43095.32888	48384.72854	
2.2	1632.341642	31176.90557	39768.184	26971.52759	40213.53038	26723.61641	31195.88539	39983.46048	40447.07705	45805.0674	
2.25	770.6101902	29791.80261	37468.76737	24745.78505	37905.8235	24506.87008	29802.43735	37680.06207	38137.55832	43537.77378	
2.3	265.1488387	28436.20325	35472.16518	23086.29701	35901.36529	22869.28396	28443.32147	35679.39258	36130.59633	41499.71882	
2.35	23.9416	27155.18776	33729.61849	21993.25394	34151.55261	21810.1848	27160.82584	33932.87374	34378.28432	39674.92126	
2.4	40.98326001	26023.22802	32209.50921	21384.47898	32625.18822	21241.65107	26028.23365	32409.21692	32849.72729	38032.58757	
2.45	289.0315806	25191.34036	30907.33291	21102.65888	31318.55425	21001.54888	25196.08887	31104.53761	31541.47487	36263.14175	
2.5	701.7982373	24360.72332	29771.48611	21006.2606	30180.13191	20943.37122	24365.48451	29967.23918	30401.87075	34758.67795	
2.55	1244.787435	23713.46766	28795.63907	21019.85753	29187.53882	20967.21166	23734.35399	28981.09995	29408.04112	33501.06279	
2.6	1889.542058	23254.40969	27942.68932	21112.14116	28326.92628	21067.52253	23277.17742	28122.02382	28547.59604	32451.43193	
2.65	2647.030146	22962.68783	27235.57224	21263.9884	27612.23617	21220.90305	22988.26702	27408.54927	27833.82664	31418.44155	
2.7	3443.73357	22747.53682	26607.11722	21424.21682	26976.41494	21378.23487	22777.45461	26773.74127	27199.38097	30636.03019	
2.75	4277.974055	22619.40338	26060.92868	21588.45121	26422.55316	21536.67428	22654.68068	26220.78543	26647.3742	29970.99661	
2.8	5139.508341	22567.28021	25588.20635	21753.37331	25941.30384	21694.08225	22608.0243	25740.47348	26168.43622	29389.35148	
2.85	6021.449782	22582.44726	25183.07446	21917.33867	25525.95506	21850.65227	22626.65928	25326.30166	25755.85017	28869.05173	
2.9	6914.910017	22653.68103	24838.83035	22076.8889	25168.46355	22005.37995	22696.0652	24970.59216	25401.55771	28400.00209	
2.95	7811.414227	22768.94921	24550.30129	22228.84424	24861.23038	22157.14264	22800.37638	24666.51236	25097.94625	27975.33682	
3	8703.421334	22922.01804	24315.67183	22370.63936	24597.52973	22303.82367	22914.57907	24409.4582	24838.28204	27589.53299	
3.05	9584.327212	23071.71734	24140.13189	22500.17846	24371.52964	22441.95421	23038.02665	24202.49909	24616.73284	27237.94325	
3.1	10448.36952	23208.22755	24043.86553	22615.51813	24178.20792	22567.14227	23117.84349	24089.22176	24428.28533	26916.60742	
3.15	11290.50725	23277.71502	24062.83964	22714.42318	24012.32369	22674.07055	23142.24517	24132.13107	24268.63144	26622.17994	
3.2	12106.32111	23266.8816	24201.26686	22793.84739	23871.93338	22755.00508	23130.48033	24134.07655	24283.76221	26351.90558	
3.25	12900.9349	23223.43681	24424.88735	22854.78557	23762.43521	22804.58731	23128.46909	24031.33891	24504.85917	26083.24929	
3.3	13652.42513	23157.65777	24671.6606	22884.12354	23660.81911	22808.13942	23135.62564	23936.65388	24744.80443	25857.62767	
3.35	14367.06161	23093.81028	24933.82016	22888.03877	23574.97718	22784.61056	23150.52985	23858.34575	24999.27582	25651.32322	
3.4	15042.33135	23036.54119	25201.41196	22874.43581	23502.80471	22751.76152	23150.97771	23794.37224	25255.65237	25466.70162	
3.45	15676.30261	22987.27131	25532.15116	22853.12155	23443.79981	22719.47861	23131.39243	23743.05922	25278.66116	25468.69953	
3.5	16267.62572	22946.14696	25787.32251	22831.32205	23434.22499	22692.02437	23102.39506	23702.9832	25123.74643	25731.98931	
3.55	16815.53453	22912.77431	26039.73063	22813.21341	23463.8132	22671.14079	23073.03853	23672.89383	24979.77919	25988.71451	
3.6	17319.8565	22886.52889	26284.79886	22801.02628	23492.40855	22657.53778	23047.14002	23651.67376	24848.62316	26237.01849	
3.65	17781.02781	22866.70545	26520.75478	22796.0021	23517.80583	22651.57186	23025.90183	23638.32116	24730.01407	26475.55567	
3.7	18200.07437	22852.58867	26746.48652	22798.94348	23539.10803	22653.60692	23009.50986	23631.93104	24623.55153	26703.38316	
3.75	18578.56764	22843.48546	26961.27134	22810.48208	23556.00687	22664.27504	22997.7929	23631.67363	24528.83599	26919.8757	
3.8	18918.55424	22838.74546	27164.69014	22831.16789	23568.51364	22684.71368	22990.5257	23636.77789	24445.46883	27124.68238	
3.85	19222.46061	22872.98172	27356.61295	22837.76829	23577.76735	22726.61334	22988.56236	23642.91871	24373.06158	27317.67473	
3.9	19492.97427	22913.77661	27536.9401	22840.00491	23582.55204	22771.67064	22990.96637	23656.55356	24310.97467	27498.90602	
3.95	19732.92624	22963.1813	27705.89998	22844.96033	23584.38039	22826.11312	23000.13713	23673.50959	24258.61326	27668.58321	
4	19945.16743	23020.68234	27863.76893	22880.398	23584.2423	22852.18608	23019.77581	23693.11605	24215.16985	27827.01457	
4.1	20297.49067	23146.3498	28147.82499	22946.1227	23583.53317	22871.90453	23110.54973	23737.68426	24151.19495	28111.83495	
4.2	20570.22527	23214.82502	28392.79525	22974.39103	23592.26375	22896.49174	23210.34823	23786.9967	24110.92114	28357.23601	
4.3	20780.5228	23210.06537	28602.91278	22995.63703	23626.04556	22923.88502	23279.58981	23832.69969	24086.83256	28567.53863	
4.4	20947.20309	23204.97292	28782.43157	23015.59827	23681.04424	22952.53171	23310.56069	23875.11232	24073.34084	28747.10163	
4.5	21069.79997	23200.44659	28935.44887	23035.30116	23743.06147	22981.29346	23319.80605	23913.11407	24066.7094	28900.07748	
4.6	21163.36609	23197.32493	29065.72667	23054.92276	23801.90559	23009.36322	23320.2657	23931.35398	24064.55255	29030.26388	
4.7	21238.1479	23196.06514	29176.63118	23074.85139	23853.85769	23050.85712	23317.88808	23944.88037	24065.34553	29141.04919	
4.8	21296.63735	23196.71649	29271.10867	23097.984	23898.3634	23084.80581	23314.93223	23960.76806	24068.08276	29235.39267	
4.9	21342.77619	23199.04847	29351.70227	23126.30034	23936.00768	23106.35948	23312.14066	23977.48175	24072.08233	29315.84426	
5	21379.51541	23202.69673	29420.58484	23152.40972	23967.69037	23124.37958	23309.6835	23994.07747	24076.87704	29384.57973	
5.1	21409.05503	23207.27024	29479.60004	23174.80329	23994.32012	23143.11294	23307.53729	24010.00442	24082.15619	29443.44316	
5.2	21433.03507	23212.41446	29530.30117	23193.85868	24016.70934	23162.16948	23305.63002	24024.96378	24087.74333	29493.98696	
5.3	21452.68378	23217.84102	29573.9954	23210.07143	24035.55135	23178.80528	23303.89651	24038.81742	24093.6099	29537.51647	
5.4	21468.9243	23223.87997	29611.77489	23223.87996	24051.41794	23193.01679	23302.28617	24051.52319	24099.86664	29575.12352	
5.5	21482.45531	23235.65648	29644.55482	23235.65643	24063.09805	23205.13179	23300.76665	24064.77217	24106.5305	29607.72116	
5.6	21493.81335	23245.71584	29673.10459	23245.71583	24073.59565	23215.46861	23299.32364	24075.98721	24113.21714	29636.07879	
5.7	21503.40625	23254.31828	29698.05817	23254.31817	24083.08151	23224.29704	23297.94491	24085.35027	24119.48481	29660.83063	
5.8	21511.55908	23261.68979	29719.95415	23261.68975	24091.63788	23231.85649	23296.63431	24093.10096	24125.15132	29682.51653	
5.9	21518.52113	23268.01503	29739.24227	23268.01502	24099.34146	23238.34551	23295.39129	24099.44189	24130.18933	29701.58778	
6	21524.49248	23273.45197	29756.2986	23273.45196	24104.57626	23243.94288	23294.22064	24106.26988	24134.63613	29718.42255	
7	21554.45408	23288.77388	29857.22059	23288.77378	24124.60872	23283.59202	23300.83403	24146.97093	24158.28871	29817.3358	
8	21563.40965	23302.24334	29898.38514	23302.23096	24128.39649	23297.21531	23309.86556	24162.22248	24165.61299	29857.3155	
9	21566.65935	23310.26983	29897.73028	23310.26714	24128.85176	23302.00166	23314.03931	24166.92715	24168.45094	29855.91475	
10	21568.12377	23314.11823	29892.33718	23314.11723	24127.92095	23303.72857	23316.28472	24168.05427	24170.70896	29850.0929	

Table SIII R-dependent transition dipole moments of the selected Ω transitions for $F^3\Sigma_{u1}^+ - X^3\Sigma_{g1}^-$, $F^3\Sigma_{u0^-}^+ - X^3\Sigma_{g1}^-$, $H^3\Sigma_{u1}^- - X^3\Sigma_{g1}^-$, $H^3\Sigma_{u1}^- - X^3\Sigma_{g0^+}^-$, $H^3\Sigma_{u0^+}^- - X^3\Sigma_{g0^+}^-$, and $H^3\Sigma_{u0^+}^- - X^3\Sigma_{g1}^-$.

R	$F^3\Sigma_{u1}^+ - X^3\Sigma_{g1}^-$	$F^3\Sigma_{u0^-}^+ - X^3\Sigma_{g1}^-$	$H^3\Sigma_{u1}^- - X^3\Sigma_{g1}^-$	$H^3\Sigma_{u1}^- - X^3\Sigma_{g0^+}^-$	$H^3\Sigma_{u0^+}^- - X^3\Sigma_{g0^+}^-$	$H^3\Sigma_{u0^+}^- - X^3\Sigma_{g1}^-$
2.1	0	0.9967	0.9936	0.9873	0.9989	0.1945
2.15	0	0.9964	0.9936	0.9916	0.9991	0.21635
2.2	0	0.9962	0.9965	0.9918	0.9994	0.25888
2.25	0	0.9958	0.9982	0.9902	0.9996	0.33831
2.3	0	0.9954	0.9988	0.9878	0.9997	0.46394
2.35	0	0.9951	0.999	0.9959	0.9997	0.62479
2.4	0	0.9946	0.9992	0.9954	0.9996	0.75697
2.45	0	0.9941	0.999	0.9949	0.9995	0.80449
2.5	0	0.9934	0.9988	0.9943	0.9993	0.81214
2.55	0.0076	0.993	0.9854	0.9939	0.9949	0.80436
2.6	0.0116	0.9922	0.9796	0.9932	0.9935	0.79296
2.65	0.0174	0.9913	0.9714	0.9924	0.9917	0.75744
2.7	0.0266	0.9902	0.9588	0.9914	0.9895	0.74036
2.75	0.0398	0.9888	0.9406	0.9902	0.9863	0.72682
2.8	0.0574	0.9873	0.9158	0.9887	0.9819	0.71449
2.85	0.076	0.9854	0.8858	0.987	0.9753	0.70123
2.9	0.0888	0.983	0.854	0.9849	0.9647	0.68655
2.95	0.0882	0.9802	0.8206	0.9824	0.9463	0.67032
3	0.0708	0.9768	0.775	0.9793	0.911	0.65252
3.05	0.0394	0.9726	0.6876	0.9755	0.8359	0.63311
3.1	0.0076	0.9671	0.5326	0.9707	0.6739	0.61211
3.15	0.0044	0.9602	0.3558	0.9647	0.4185	0.58951
3.2	0.0644	0.9514	0.2316	0.957	0.2128	0.56535
3.25	0.2104	0.9398	0.1564	0.947	0.1108	0.5322
3.3	0.3784	0.9246	0.106	0.9338	0.0643	0.50575
3.35	0.4194	0.9042	0.0692	0.9162	0.041	0.47831
3.4	0.3148	0.877	0.0414	0.8926	0.0282	0.45005
3.45	0.1892	0.8406	0.0234	0.8607	0.0204	0.42114
3.5	0.1144	0.7928	0.0142	0.8179	0.0154	0.39177
3.6	0.0552	0.6592	0.0066	0.6923	0.0096	0.33253
3.7	0.0364	0.4962	0.0038	0.5258	0.0064	0.27461
3.8	0.0312	0.3552	0.0024	0.3712	0.0044	0.22059
3.9	0.04	0.2606	0.0014	0.2641	0	0.17279
4	0.086	0.204	4E-4	0.1992	0	0.13263

Table SIV Franck-Condon factors of the $F^3\Sigma_{u1}^+ - X^3\Sigma_{g1}^-$, $F^3\Sigma_{u0^-}^+ - X^3\Sigma_{g1}^-$, $H^3\Sigma_{u1}^- - X^3\Sigma_{g1}^-$, $H^3\Sigma_{u1}^- - X^3\Sigma_{g0^+}^-$, $H^3\Sigma_{u0^+}^- - X^3\Sigma_{g0^+}^-$ and $H^3\Sigma_{u0^+}^- - X^3\Sigma_{g1}^-$ transitions.

	v''=0	1	2	3	4	5	6	7	8	9
$F^3\Sigma_{u1}^+ - X^3\Sigma_{g1}^-$										
v'=0	0.05832	0.15901	0.22372	0.21183	0.15639	0.09726	0.05226	0.02450	0.01027	0.00402
1	0.13177	0.18082	0.07188	0.00011	0.04596	0.11910	0.14559	0.12382	0.08410	0.04914
2	0.15475	0.07922	0.00180	0.08318	0.09827	0.02726	0.00166	0.04520	0.09761	0.11795
3	0.14465	0.01411	0.05134	0.08475	0.07093	0.02727	0.08010	0.05756	0.00954	0.00454
4	0.12184	0.00027	0.08147	0.02289	0.07093	0.07318	0.02543	0.00279	0.04634	0.06793
5	0.09575	0.01280	0.06784	0.00010	0.06149	0.03045	0.00499	0.05412	0.04404	0.00346
6	0.07315	0.03085	0.03818	0.01761	0.05559	0.00008	0.04522	0.03893	0.00010	0.02873
7	0.05475	0.04454	0.01386	0.04050	0.02406	0.01687	0.04921	0.00192	0.02717	0.04464
8	0.04061	0.05156	0.00192	0.04937	0.00280	0.04123	0.01937	0.01161	0.04493	0.00893
9	0.02994	0.05273	0.00035	0.04370	0.00161	0.04468	0.00059	0.03658	0.02123	0.00376
$F^3\Sigma_{u0^-}^+ - X^3\Sigma_{g1}^-$										
v'=0	0.03873	0.12282	0.20036	0.21642	0.17740	0.11895	0.06750	0.03324	0.01470	0.00608
1	0.09983	0.17291	0.10355	0.00982	0.01817	0.09006	0.13885	0.13511	0.10080	0.06341
2	0.13478	0.10539	0.00254	0.04943	0.10214	0.05285	0.00171	0.02149	0.07596	0.11157
3	0.13888	0.03460	0.02365	0.08832	0.02646	0.00716	0.06514	0.07302	0.02570	1.5×10^{-6}
4	0.12582	0.00283	0.06438	0.04446	0.00383	0.06353	0.04592	0.00060	0.02747	0.06599
5	0.10477	0.00282	0.07144	0.00461	0.04227	0.04851	0.00007	0.03808	0.05532	0.01418
6	0.08325	0.01663	0.05217	0.00395	0.05802	0.00711	0.02666	0.05014	0.00604	0.01423
7	0.06410	0.03143	0.02724	0.02323	0.03865	0.00348	0.04927	0.01219	0.01192	0.04604
8	0.04849	0.04161	0.00935	0.03898	0.01313	0.02455	0.03313	0.00140	0.04009	0.02127
9	0.03632	0.04615	0.00117	0.04259	0.00075	0.03874	0.00843	0.02089	0.03275	0.00005
$H^3\Sigma_{u1}^- - X^3\Sigma_{g1}^-$										
v'=0	1.51×10^{-10}	3.82×10^{-9}	5.02×10^{-8}	4.29×10^{-7}	2.72×10^{-6}	1.36×10^{-5}	5.47×10^{-5}	1.84×10^{-4}	5.37×10^{-4}	1.39×10^{-3}
1	2.41×10^{-9}	5.62×10^{-8}	6.76×10^{-7}	5.28×10^{-6}	3.02×10^{-5}	1.35×10^{-4}	4.85×10^{-4}	1.44×10^{-3}	3.64×10^{-3}	8.10×10^{-3}
2	1.80×10^{-8}	3.89×10^{-7}	4.30×10^{-6}	3.06×10^{-5}	1.59×10^{-4}	6.38×10^{-4}	2.03×10^{-3}	5.28×10^{-3}	1.15×10^{-2}	2.17×10^{-2}
3	7.74×10^{-8}	1.55×10^{-6}	1.59×10^{-5}	1.04×10^{-4}	4.89×10^{-4}	1.77×10^{-3}	5.01×10^{-3}	1.14×10^{-2}	2.14×10^{-2}	3.37×10^{-2}
$H^3\Sigma_{u1}^- - X^3\Sigma_{g0^+}^-$										
v'=0	2.31×10^{-10}	5.83×10^{-9}	7.30×10^{-8}	3.71×10^{-6}	1.79×10^{-5}	7.02×10^{-5}	2.31×10^{-4}	6.60×10^{-4}	1.68×10^{-3}	3.71×10^{-6}

1	3.63×10^{-9}	8.44×10^{-8}	9.66×10^{-7}	4.04×10^{-5}	1.75×10^{-4}	6.07×10^{-4}	1.75×10^{-3}	4.34×10^{-3}	9.45×10^{-3}	4.04×10^{-5}
2	2.68×10^{-8}	5.75×10^{-7}	6.04×10^{-6}	2.08×10^{-4}	8.05×10^{-4}	2.48×10^{-3}	6.25×10^{-3}	1.33×10^{-2}	2.43×10^{-2}	2.08×10^{-4}
3	1.14×10^{-7}	2.26×10^{-6}	2.19×10^{-5}	6.28×10^{-4}	2.18×10^{-3}	5.96×10^{-3}	1.31×10^{-2}	2.38×10^{-2}	3.63×10^{-2}	6.28×10^{-4}
$H^3\Sigma_{u0}^{-}+ - X^3\Sigma_{g1}^{-}$										
v'=0	1.17×10^{-10}	2.99×10^{-9}	3.98×10^{-8}	3.45×10^{-7}	2.21×10^{-6}	1.12×10^{-5}	4.56×10^{-5}	1.56×10^{-4}	4.61×10^{-4}	1.21×10^{-3}
1	2.13×10^{-9}	5.02×10^{-8}	6.10×10^{-7}	4.81×10^{-6}	2.79×10^{-5}	1.26×10^{-4}	4.56×10^{-4}	1.36×10^{-3}	3.49×10^{-3}	7.86×10^{-3}
2	1.93×10^{-8}	4.19×10^{-7}	4.65×10^{-6}	3.33×10^{-5}	1.73×10^{-4}	6.97×10^{-4}	2.23×10^{-3}	5.79×10^{-3}	1.27×10^{-2}	2.38×10^{-2}
3	1.10×10^{-7}	2.20×10^{-6}	2.24×10^{-5}	1.45×10^{-4}	6.80×10^{-4}	2.43×10^{-3}	6.78×10^{-3}	1.52×10^{-2}	2.79×10^{-2}	4.28×10^{-2}
4	3.97×10^{-7}	7.34×10^{-6}	6.86×10^{-5}	4.06×10^{-4}	1.71×10^{-3}	5.44×10^{-3}	1.33×10^{-2}	2.55×10^{-2}	3.89×10^{-2}	4.72×10^{-2}
$H^3\Sigma_{u0}^{-}+ - X^3\Sigma_{g0}^{-}+$										
v'=0	1.79×10^{-10}	4.58×10^{-9}	5.81×10^{-8}	4.86×10^{-7}	3.02×10^{-6}	1.48×10^{-5}	5.87×10^{-5}	1.96×10^{-4}	5.68×10^{-4}	1.47×10^{-3}
1	3.22×10^{-9}	7.55×10^{-8}	8.74×10^{-7}	6.64×10^{-6}	3.72×10^{-5}	1.63×10^{-4}	5.71×10^{-4}	1.67×10^{-3}	4.17×10^{-3}	9.18×10^{-3}
2	2.88×10^{-8}	6.20×10^{-7}	6.54×10^{-6}	4.50×10^{-5}	2.27×10^{-4}	8.80×10^{-4}	2.72×10^{-3}	6.85×10^{-3}	1.46×10^{-2}	2.67×10^{-2}
3	1.63×10^{-7}	3.22×10^{-6}	3.11×10^{-5}	1.94×10^{-4}	8.74×10^{-4}	3.01×10^{-3}	8.09×10^{-3}	1.75×10^{-2}	3.11×10^{-2}	4.59×10^{-2}
4	6.41×10^{-7}	1.17×10^{-5}	1.03×10^{-4}	5.84×10^{-4}	2.36×10^{-3}	7.19×10^{-3}	1.68×10^{-2}	3.08×10^{-2}	4.48×10^{-2}	5.15×10^{-2}