

Decay for spin conserved transitions			Hybrid spin 0																				
Hybrid	Charm			Decay																			
nL_J	E MeV	n'L' MeV	E' MeV	\Delta E MeV	\Delta (\Delta E) MeV	C^2	INT<irf> 1/GeV	\Delta(m) GeV	<H r S>\Delta E GeV	<H r> GeV	<fr> GeV	\cal{V}/m MeV	\Gamma/m MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error		
\$2p_0\\$	4917 \$1s\\$	3068	1849	0.30	0.33	0.51	1.26	<b>0.54</b>	0.29	2.06	1.00	<b>37</b>	0.25	0.32	0.007	0.67	0.099	0.12	0.80	<b>29</b>			
\$3p_0\\$	5315 \$1s\\$	3068	2247	0.28	0.33	0.20	1.53	<b>0.26</b>	0.12	2.06	1.27	<b>9</b>	0.21	0.29	0.002	0.55	0.146	0.16	0.69	<b>6</b>			
	\$2s\\$	3674	1641	0.32	0.33	0.51	1.12	0.48	0.29	3.84	1.38	27	0.28	0.35	0.006	<b>1.46</b>	0.078	0.17	<b>1.54</b>	<b>41</b>			
	\$1d\\$	3762	1553	0.32	0.67	-0.16	1.06	0.21	0.13	4.05	1.41	<b>5</b>	0.30	0.36	0.001	<b>1.63</b>	0.070	0.18	<b>1.70</b>	<b>8</b>			
Hybrid	Bottom			Decay																			
\$2p_0\\$	11261 \$1s\\$	9551	1710	0.31	0.33	0.47	0.35	<b>0.46</b>	0.27	1.21	0.19	<b>25</b>	0.08	0.34	0.005	0.41	0.008	0.02	0.54	<b>13</b>			
\$3p_0\\$	11525 \$1s\\$	9551	1974	0.29	0.33	0.25	0.40	<b>0.29</b>	0.15	1.21	0.24	<b>11</b>	0.07	0.31	0.002	0.35	0.010	0.03	0.48	<b>5</b>			
	\$2s\\$	10017	1508	0.33	0.33	0.61	0.31	0.53	0.35	2.45	0.26	31	0.09	0.37	0.007	<b>0.99</b>	0.006	0.03	<b>1.06</b>	<b>33</b>			
	\$1d\\$	10106	1419	0.34	0.67	-0.30	0.29	0.35	0.24	2.62	0.27	13	0.10	0.39	0.001	<b>1.13</b>	0.005	0.03	<b>1.20</b>	<b>15</b>			
Hybrid	Charm			Decay																			
nL_J	E/(E) MeV	n'L' MeV	E' MeV	\Delta E MeV	\Delta (\Delta E) MeV	C^2	INT<irf> 1/GeV	\Delta(m) GeV	<H r S>\Delta E GeV	<H r> GeV	<fr> GeV	\cal{V}/m MeV	\Gamma/m MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error		
\$2p_1\\$	4556 \$1s\\$	3068	1488	0.330	0.333	0.816	1.012	<b>0.701</b>	0.471	2.06	0.750	<b>54</b>	0.31	0.37	0.012	0.83	0.064	0.09	0.97	<b>52</b>			
\$3p_1\\$	4912 \$1s\\$	3068	1844	0.300	0.333	0.396	1.254	<b>0.422</b>	0.229	2.06	0.992	<b>22</b>	0.25	0.32	0.004	0.67	0.098	0.12	0.80	<b>18</b>			
	\$2s\\$	3674	1238	0.361	0.333	0.988	0.842	0.707	0.571	3.84	1.107	50	0.38	0.44	0.012	<b>1.93</b>	0.044	0.14	<b>2.02</b>	<b>100</b>			
	\$1d\\$	3762	1150	0.375	0.667	-0.462	0.762	0.434	0.377	4.05	1.134	<b>18</b>	0.41	0.47	0.002	<b>2.20</b>	0.038	0.14	<b>2.29</b>	<b>41</b>			
Hybrid	Bottom			Decay																			
\$1p_1\\$	10772 \$1s\\$	9551	1221	0.364	0.333	1.027	0.250	<b>0.724</b>	0.593	1.21	0.155	<b>52</b>	0.11	0.44	0.013	0.57	0.004	0.02	0.73	<b>38</b>			
\$2p_1\\$	10995 \$1s\\$	9551	1444	0.334	0.333	0.659	0.296	<b>0.550</b>	0.381	1.21	0.256	<b>32</b>	0.10	0.38	0.008	0.48	0.005	0.03	0.62	<b>20</b>			
	\$2s\\$	10017	978	0.412	0.333	0.459	0.200	0.259	0.265	2.45	0.413	6	0.14	0.57	0.002	<b>1.53</b>	0.003	0.05	<b>1.64</b>	<b>10</b>			
	\$1d\\$	10106	889	0.438	0.667	-0.175	0.182	0.127	0.143	2.62	0.595	<b>14</b>	0.16	0.65	0.000	<b>1.81</b>	0.002	0.07	<b>1.93</b>	<b>2.7</b>			
\$3p_1\\$	11209 \$1s\\$	9551	1658	0.314	0.333	0.412	0.340	<b>0.394</b>	0.238	1.21	0.384	<b>18</b>	0.08	0.35	0.004	0.42	0.007	0.05	0.55	<b>10</b>			
	\$2s\\$	10017	1192	0.368	0.333	0.605	0.244	0.416	0.349	2.45	0.408	17	0.12	0.45	0.004	<b>1.25</b>	0.004	0.05	<b>1.34</b>	<b>23</b>			
	\$3s\\$	10355	854	0.450	0.333	0.123	0.175	0.061	0.071	3.43	1.039	0.3	0.16	0.70	0.000	<b>2.49</b>	0.002	0.13	<b>2.60</b>	<b>8</b>			
	\$1d\\$	10106	1103	0.384	0.667	-0.285	0.226	0.256	0.232	2.62	0.502	<b>6</b>	0.13	0.49	0.001	<b>1.46</b>	0.003	0.06	<b>1.54</b>	<b>10</b>			
Hybrid	Bottom			Decay																			
nL_J	E/(E) MeV	n'L' MeV	E' MeV	\Delta E MeV	\Delta (\Delta E) MeV	C+	C-	INT<+irf> 1/GeV	INT<-irf> 1/GeV	\Delta(m) GeV	<H r S>\Delta E GeV	<H r> GeV	<fr> GeV	\cal{V}/m MeV	\Gamma/m MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error
\$2(s/d)_1\\$	10905 \$1p\\$	9879	1026	0.400	0.4	1.0	0.680	0.022	0.214	0.464	0.452	1.985	0.130	<b>18</b>	0.14	0.53	0.004	<b>1.17</b>	0.003	0.02	<b>1.29</b>	<b>23</b>	
\$2(s/d)_1\\$	10885 \$1p\\$	9899	<b>986</b>	0.410	0.4	1.0	0.680	0.022	0.205	0.446	0.452	1.985	0.130	<b>16</b>	<b>0.00</b>	0.56	0.004	<b>1.21</b>	0.003	0.02	<b>1.34</b>	<b>22</b>	
\$3(s/d)_1\\$	11103 \$1p\\$	9879	1224	0.363	0.4	1.0	1.485	-0.194	0.255	0.911	0.745	1.985	0.170	136	0.11	0.44	0.021	0.98	0.004	0.02	<b>1.08</b>	<b>147</b>	
\$3(s/d)_1\\$	11100 \$1p\\$	9899	<b>1201</b>	0.367	0.4	1.0	1.485	-0.194	0.250	0.894	0.745	1.985	0.174	130	<b>0.00</b>	0.45	0.020	<b>1.00</b>	0.004	0.02	<b>1.09</b>	<b>142</b>	
\$3(s/d)_1\\$	11103 \$2p\\$	10234	869	0.444	0.4	1.0	-0.924	0.938	0.181	0.307	0.353	3.030	0.188	79	0.16	0.68	0.000	<b>2.15</b>	0.002	0.02	<b>2.26</b>	<b>179</b>	
\$3(s/d)_1\\$	11000 \$2p\\$	10260	<b>740</b>	0.499	0.4	1.0	-0.924	0.938	0.154	0.262	0.353	3.030	0.172	55	<b>0.00</b>	0.67	0.000	<b>2.53</b>	0.001	0.02	<b>2.62</b>	<b>143</b>	

Decay for spin flipped transitions																	Hybrid spin 0									
Hybrid		Charm			Decay																					
nL_J	E/(E)	n'L'	E'	\D E	\a (\D E)	K^2	INT< i f >	INT< i r f >	< H S >\D E/m	<  r f>\DE	< i r f >	< f r f >	\calV/m	\Gamma	MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error			
\$2p\_0\\$	4917	\$1p\\$	3457	1460	0.333	3	0.135	-0.562	0.233	0.820	0.562	3.141	1.074	6	0.32	0.38	0.028	1.33	0.062	0.22	1.44	8				
	5315	\$1p\\$	3457	1858	0.299	3	0.050	-0.202	0.109	0.375	0.202	3.141	1.345	1.5	0.25	0.32	0.006	1.05	0.100	0.28	1.16	1.7				
		\$2p\\$	3958	1357	0.345	3	0.113	-0.908	0.181	1.233	0.908	4.658	1.447	3	0.34	0.40	0.063	2.15	0.053	0.30	2.24	8				
Hybrid		Bottom			Decay																					
\$2p\_0\\$	11261	\$1p\\$	9879	1382	0.341	3	0.242	-0.056	0.119	0.078	0.056	1.985	0.203	1.5	0.10	0.40	0.000	0.87	0.005	0.04	0.96	1.4				
\$3p\_0\\$	11525	\$1p\\$	9879	1646	0.315	3	0.110	-0.112	0.064	0.185	0.112	1.985	0.257	0.5	0.09	0.35	0.001	0.73	0.007	0.05	0.81	0.4				
		\$2p\\$	10234	1291	0.353	3	0.295	0.051	0.135	0.066	0.051	3.030	0.275	2	0.11	0.42	0.000	1.45	0.004	0.06	1.51	2.8				
Hybrid		Charm			Decay																					
nL_J	E/(E)	n'L'	E'	\D E	\a (\D E)	K^2	INT< i f >	INT< i r f >	< H S >\D E/m	<  r f>\DE	< i r f >	< f r f >	\calV/m	\Gamma	MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error			
\$2p\_1\\$	4556	\$1p\\$	3457	1099	0.385	3	0.291	0.118	0.376	0.129	0.118	3.141	0.829	13	0.42	0.49	0.001	1.77	0.035	0.17	1.89	25				
\$3p\_1\\$	4912	\$1p\\$	3457	1455	0.333	3	0.124	-0.123	0.213	0.178	0.123	3.141	1.071	5	0.38	0.38	0.001	1.33	0.061	0.22	1.44	7				
		\$2p\\$	3958	954	0.418	3	0.326	0.314	0.366	0.300	0.314	4.658	1.173	12	0.49	0.59	0.004	3.06	0.026	0.24	3.16	38				
Hybrid		Bottom			Decay																					
\$1p\_1\\$	10772	\$1p\\$	9879	893	0.436	3	0.847	2.029	0.269	1.812	2.029	3.141	0.042	6	0.16	0.65	0.137	2.17	0.002	0.01	2.28	14				
\$2p\_1\\$	10959	\$1p\\$	9879	1116	0.382	3	0.438	0.553	0.173	0.617	0.553	3.141	0.088	3	0.13	0.48	0.016	1.74	0.003	0.02	1.81	5				
\$3p\_1\\$	11209	\$1p\\$	9879	1330	0.348	3	0.235	0.126	0.111	0.168	0.126	3.141	0.132	1.3	0.11	0.41	0.001	1.46	0.005	0.03	1.52	1.9				
		\$2p\\$	10234	975	0.413	3	0.441	0.838	0.153	0.818	0.838	4.658	0.133	2.1	0.14	0.57	0.028	3.00	0.002	0.03	3.05	6.4				
Hybrid		Charm			Decay																					
nL_J	E/(E)	n'L'	E'	\D E	\a (\D E)	K^2	INT< i f +>	INT< i f ->	INT< i r f +>	INT< i r f ->	< H S >\D E/m	<  r f>\DE	< i r f >	< f r f >	\calV/m	\Gamma	MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error	
\$2(s/d)\_1\\$	4394	\$1s\\$	3068	1326	0.35	3	-0.36	-0.25	0.56	0.33	0.246	2.06	0.640	33	0.35	0.41	0.004	0.94	0.051	0.13	1.09	36				
\$2(s/d)\_1\\$	4374	\$1s\\$	3097	1277	0.36	3	-0.36	-0.25	0.54	0.31	0.246	2.06	0.646	30	0.00	0.42	0.004	0.97	0.047	0.13	1.07	32				
\$2(s/d)\_1\\$	4415	\$1s\\$	3097	1318	0.35	3	-0.36	-0.25	0.56	0.32	0.246	2.06	0.674	32	0.00	0.41	0.004	0.94	0.050	0.14	1.04	33				
\$3(s/d)\_1\\$	4678	\$1s\\$	3068	1610	0.32	3	-0.03	-0.35	0.05	0.57	0.354	2.06	0.833	0.3	0.29	0.35	0.014	0.77	0.075	0.17	0.92	0.31				
\$3(s/d)\_1\\$	4623	\$1s\\$	3097	1526	0.33	3	-0.03	-0.35	0.05	0.54	0.354	2.06	0.816	0.3	0.00	0.37	0.012	0.81	0.067	0.17	0.91	0.27				
		\$2s\\$	3674	1004	0.41	3	0.40	1.89	0.48	1.90	1.891	3.84	0.948	21	0.46	0.55	0.150	2.38	0.029	0.20	2.50	52				
Hybrid		Bottom			Decay																					
\$1(s/d)\_1\\$	10704	\$1s\\$	9551	1153	0.37	3	-0.77	-1.24	0.32	1.43	1.238	1.21	0.071	10	0.12	0.47	0.085	0.60	0.003	0.01	0.78	7				
\$1(s/d)\_1\\$	10753	\$1s\\$	9460	1293	0.35	3	-0.77	-1.24	0.36	1.60	1.238	1.21	0.063	13	0.00	0.42	0.107	0.54	0.004	0.01	0.69	9				
\$2(s/d)\_1\\$	10905	\$1s\\$	9551	1354	0.34	3	-0.49	-0.48	0.24	0.65	0.481	1.21	0.112	6	0.10	0.40	0.018	0.51	0.005	0.02	0.66	4				
\$2(s/d)\_1\\$	10885	\$1s\\$	9460	1425	0.34	3	-0.49	-0.48	0.25	0.69	0.481	1.21	0.090	7	0.00	0.39	0.020	0.49	0.005	0.02	0.62	4				
\$3(s/d)\_1\\$	11103	\$1s\\$	9551	1552	0.32	3	-0.18	-0.17	0.10	0.26	0.167	1.21	0.153	1	0.09	0.36	0.003	0.45	0.006	0.03	0.58	6				
\$3(s/d)\_1\\$	11000	\$1s\\$	9460	1540	0.32	3	-0.18	-0.17	0.10	0.26	0.167	1.21	0.113	1	0.00	0.36	0.003	0.45	0.006	0.02	0.58	6				
		\$2s\\$	10017	888	0.44	3	-0.02	0.28	0.01	0.25	0.277	2.45	0.133	0.005	0.16	0.65	0.003	1.68	0.002	0.03	1.81	0.008				
		\$1d\\$	10106	799	0.47	3	0.70	1.79	0.20	1.43	1.789	2.62	0.142	3	0.18	0.72	0.085	2.01	0.002	0.03	2.14	7				

Decay for spin flipped transitions																						
Hybrid		Hybrid spin 1																				
nL_J	E/{E}	Charm		Decay																		
	MeV	n'l'	E'	\D E	K^2	INT<if>	int<ifr>	<H S>\D E/m	<i r f>\D E	<i r f>	<f r f>	\calV/m	\Gammaamma	MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error
	MeV	MeV	MeV	1/GeV	1/GeV			GeV	GeV	GeV	GeV	MeV	MeV	MeV								
\$2p_0\$	4917 \$1p\$	3457	1460	0.333	1	0.135	-0.562	0.135	0.820	0.562	3.141	1.074	2.0	0.32	0.38	0.028	1.33	0.062	0.22	1.44	3	
\$3p_0\$	5315 \$1p\$	3457	1858	0.299	1	0.050	-0.202	0.063	0.375	0.202	3.141	1.345	0.5	0.25	0.32	0.006	1.05	0.100	0.28	1.16	6	
	\$2p\$	3958	1357	0.345	1	0.113	-0.908	0.105	1.233	0.908	4.658	1.447	1.1	0.34	0.40	0.063	2.15	0.053	0.30	2.24	3	
Hybrid	Bottom	Decay																				
\$2p_0\$	11261 \$1p\$	9879	1382	0.341	1	0.242	-0.056	0.069	0.078	0.056	1.985	0.203	0.5	0.10	0.40	0.000	0.87	0.005	0.04	0.96	5	
\$3p_0\$	11525 \$1p\$	9879	1646	0.315	1	0.110	-0.112	0.037	0.185	0.112	1.985	0.257	0.2	0.09	0.35	0.001	0.73	0.007	0.05	0.81	1	
	\$2p\$	10234	1291	0.353	1	0.295	0.051	0.078	0.066	0.051	3.030	0.275	0.6	0.11	0.42	0.000	1.45	0.004	0.06	1.51	9	

Decay for spin flipped transitions																						
Hybrid		Charm																				
nL_J	E/{E}	Charm		Decay																		
	MeV	n'l'	E'	\D E	K^2	INT<if>	int<ifr>	<H S>\D E/m	<i r f>\D E	<i r f>	<f r f>	\calV/m	\Gammaamma	MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error
	MeV	MeV	MeV	1/GeV	1/GeV			GeV	GeV	GeV	GeV	MeV	MeV	MeV								
\$1p_1\$	4171 \$1p\$	3457	714	0.513	1	0.944	3.318	0.459	2.369	3.318	3.141	0.567	17	0.65	0.65	0.234	2.72	0.015	0.12	2.88	49	
\$2p_1\$	4556 \$1p\$	3457	1099	0.385	1	0.291	0.118	0.217	0.129	0.118	3.141	0.829	4	0.42	0.48	0.001	1.77	0.035	0.17	1.89	8	
\$3p_1\$	4912 \$1p\$	3457	1455	0.333	1	0.124	-0.123	0.123	0.178	0.123	3.141	1.071	1.6	0.32	0.38	0.001	1.33	0.061	0.22	1.44	23	
Hybrid	Bottom	Decay																				
\$1p_1\$	10772 \$1p\$	9879	893	0.436	1	0.847	2.029	0.155	1.812	2.029	1.985	0.102	2.1	0.16	0.65	0.137	1.34	0.002	0.02	1.50	31	
\$2p_1\$	10995 \$1p\$	9879	1116	0.382	1	0.438	0.553	0.100	0.617	0.553	1.985	0.148	0.9	0.13	0.48	0.016	1.07	0.003	0.03	1.18	11	
\$3p_1\$	11209 \$1p\$	9879	1330	0.348	1	0.235	0.126	0.064	0.168	0.126	1.985	0.192	0.4	0.11	0.41	0.001	0.90	0.005	0.04	0.99	4	
	\$2p\$	10234	975	0.413	1	0.441	0.838	0.088	0.818	0.838	3.030	0.210	0.7	0.14	0.57	0.028	1.92	0.002	0.04	2.01	14	

Decay for spin flipped transitions																								
Hybrid		Charm																						
nL_J	E/{E}	Charm		Decay																				
	MeV	n'l'	E'	\D E	K^2	INT+<if>	INT-<if>	int<ifr>+	int<ifr>-	<H S>\D E/m	<i f>\D E/m	<i r f>	<f r f>	\calV/m	\Gammaamma	MeV	errorE	alpha	multip	cornell	rel.1	rel.2	d\G%	error
	MeV	MeV	MeV	1/GeV	1/GeV			GeV	GeV	GeV	GeV	GeV	GeV	MeV	MeV	MeV								
\$2(s/d)_1\$	4394 \$1s\$	3068	1326	0.35	1	-0.36	-0.25	0.33	0.33	0.246	2.06	0.640	11	0.35	0.41	0.004	0.94	0.051	0.13	1.08	12			
\$2(s/d)_1\$	4351 \$1s\$	2984	1367	0.34	1	-0.36	-0.25	0.34	0.34	0.246	2.06	0.554	12	0.00	0.40	0.005	0.91	0.054	0.12	0.99	12			
\$3(s/d)_1\$	4678 \$1s\$	3068	1610	0.32	1	-0.03	-0.35	0.03	0.57	0.354	2.06	0.833	11	0.29	0.35	0.014	0.77	0.075	0.17	0.90	10			
\$3(s/d)_1\$	4626 \$1s\$	2984	1642	0.32	1	-0.03	-0.35	0.03	0.58	0.354	2.06	0.741	12	0.00	0.35	0.014	0.76	0.078	0.15	0.83	10			
Hybrid	Bottom	Decay																						
\$1(s/d)_1\$	10704 \$1s\$	9551	1153	0.375	1	-0.774	-1.238	0.183	1.428	1.238	1.21	0.071	3.2	0.12	0.47	0.085	0.60	0.003	0.01	0.78	2.5			
\$2(s/d)_1\$	10905 \$1s\$	9551	1354	0.345	1	-0.489	-0.481	0.136	0.651	0.481	1.21	0.112	2	0.10	0.40	0.018	0.51	0.005	0.02	0.66	1			
	\$2s\$	10017	888	0.438	1	-0.408	-1.232	0.074	1.094	1.232	2.45	0.133	0.5	0.16	0.65	0.050	1.68	0.002	0.03	1.81	9			
\$3(s/d)_1\$	11103 \$1s\$	9551	1552	0.323	1	-0.175	-0.167	0.056	0.259	0.167	1.21	0.153	0.3	0.09	0.36	0.003	0.45	0.006	0.03	0.58	2			
	\$2s\$	10017	1086	0.387	1	-0.023	-0.277	0.005	0.300	0.277	2.45	0.173	0.0	0.13	0.50	0.004	1.38	0.003	0.04	1.47	0			
	\$1d\$	10106	997	0.407	1	0.702	1.789	2.62	0.183	1.9	0.14	0.55	0.133	1.61	0.003	0.04	1.71	0.003	0.04	3.2				

## Decay for spin conserved transitions

Hybrid nL_J	E MeV	Charm		Decay		C^2 1/GeV	\Delta/mq	<H r S>\DE GeV^-1	<H r S> GeV^-1	<f r f> GeV^-1	\cal V /m	\Gamma MeV	
		n'L'	E'	\D E	\a (\D E)								
\$1p_0\$	4455	\$1s\$	3068	1387	0.34	0.33	2.20	0.94	1.76	1.27	2.06	0.68	325
		\$2s\$	3674	781	0.48	0.33	-2.91	0.53	1.31	1.68	3.84	0.80	144
		\$3s\$	4149	306	1.00	0.33	0.51	0.21	0.09	0.29	5.27	0.90	1
		\$4s\$	4562										
		\$1d\$	3762	693	0.53	0.67	3.66	0.47	2.07	2.99	4.05	0.82	347
		\$2d\$	4209	246	1.00	0.67	-0.28	0.17	0.06	0.22	5.41	0.92	0
		\$3d\$	4608										
		\$4d\$	4974										
\$2p_0\$	4917	\$1s\$	3068	1849	0.30	0.33	0.51	1.26	0.54	0.29	2.06	1.00	37
		\$2s\$	3674	1243	0.36	0.33	2.95	0.85	2.12	1.70	3.84	1.11	445
		\$3s\$	4149	768	0.48	0.33	-4.23	0.52	1.88	2.44	5.27	1.21	291
		\$4s\$	4562	355	1.00	0.33	0.40	0.24	0.08	0.23	6.53	1.30	1
		\$1d\$	3762	1155	0.37	0.67	-2.08	0.79	1.96	1.70	4.05	1.14	371
		\$2d\$	4209	708	0.52	0.67	4.76	0.48	2.75	3.89	5.41	1.23	615
		\$3d\$	4608	309	1.00	0.67	-0.25	0.21	0.06	0.20	6.63	1.32	0
		\$4d\$	4974										
\$3p_0\$	5315	\$1s\$	3068	2247	0.28	0.33	0.20	1.53	0.26	0.12	2.06	1.27	9
		\$2s\$	3674	1641	0.32	0.33	0.51	1.12	0.48	0.29	3.84	1.38	27
		\$3s\$	4149	1166	0.37	0.33	3.73	0.79	2.51	2.15	5.27	1.48	609
		\$4s\$	4562	753	0.49	0.33	-5.77	0.51	2.51	3.33	6.53	1.57	519
		\$1d\$	3762	1553	0.32	0.67	-0.16	1.06	0.21	0.13	4.05	1.41	5
		\$2d\$	4209	1106	0.38	0.67	-3.20	0.75	2.89	2.62	5.41	1.50	789
		\$3d\$	4608	707	0.52	0.67	6.14	0.48	3.54	5.01	6.63	1.59	1020
		\$4d\$	4974	341	1.00	0.67	-0.96	0.23	0.27	0.79	7.76	1.67	5

## Decay for spin conserved transitions

Hybrid nL_J	E/{E} MeV	Bottom		Decay		C^2 1/GeV	\Delta/mq	<i r f>\DE GeV^-1	<i r f> GeV^-1	&			\cal V /m	\Gamma MeV
		n'L'	E'	\D E	\a (\D E)					<i r f>\DE<1	&	<i r f>\DE<1		
\$1p_0\$	10977	\$1s\$	9551	1426	0.34	0.33	1.22	0.29	1.00	0.70	1.21	0.13	107	
		\$2s\$	10017	960	0.42	0.33	-2.16	0.20	1.19	1.24	2.45	0.15	127	
		\$3s\$	10355	622	0.58	0.33	0.60	0.13	0.21	0.34	3.43	0.17	4	
		\$4s\$	10643	334	1.00	0.33	0.05	0.07	0.01	0.03	4.29	0.19	0	
		\$1d\$	10106	871	0.44	0.67	2.50	0.18	1.78	2.04	2.62	0.16	271	
		\$2d\$	10416	561	0.64	0.67	-0.50	0.11	0.23	0.41	3.55	0.17	4	
		\$3d\$	10689	288	1.00	0.67	-0.06	0.06	0.01	0.05	4.38	0.19	0	
		\$4d\$	10939	38	0.00	0.67	-0.02	0.01	0.00	0.02	5.14	0.21	0	
\$2p_0\$	11261	\$1s\$	9551	1710	0.31	0.33	0.47	0.35	0.46	0.27	1.21	0.19	25	
		\$2s\$	10017	1244	0.36	0.33	1.39	0.25	1.00	0.80	2.45	0.21	99	
		\$3s\$	10355	906	0.43	0.33	-3.25	0.19	1.70	1.88	3.43	0.23	252	
		\$4s\$	10643	618	0.58	0.33	0.99	0.13	0.35	0.57	4.29	0.24	10	
		\$1d\$	10106	1155	0.37	0.67	-1.06	0.24	1.00	0.86	2.62	0.22	95	
		\$2d\$	10416	845	0.45	0.67	3.45	0.17	2.38	2.82	3.55	0.23	482	
		\$3d\$	10689	572	0.63	0.67	-0.83	0.12	0.39	0.68	4.38	0.25	12	
		\$4d\$	10939	322	1.00	0.67	-0.17	0.07	0.04	0.14	5.14	0.27	0	
\$3p_0\$	11525	\$1s\$	9551	1974	0.29	0.33	0.25	0.40	0.29	0.15	1.21	0.24	11	
		\$2s\$	10017	1508	0.33	0.33	0.61	0.31	0.53	0.35	2.45	0.26	31	
		\$3s\$	10355	1170	0.37	0.33	1.56	0.24	1.06	0.90	3.43	0.28	108	
		\$4s\$	10643	882	0.44	0.33	-3.99	0.18	2.03	2.30	4.29	0.30	356	
		\$1d\$	10106	1419	0.34	0.67	-0.30	0.29	0.35	0.24	2.62	0.27	13	
		\$2d\$	10416	1109	0.38	0.67	-1.44	0.23	1.30	1.17	3.55	0.29	159	
		\$3d\$	10689	836	0.46	0.67	4.12	0.17	2.82	3.37	4.38	0.30	672	
		\$4d\$	10939	586	0.61	0.67	-0.70	0.12	0.34	0.57	5.14	0.32	9	

Decay for spin conserved transitions				green:		\Delta E > 800			&	< r /r>/\Delta E < 1		
Hybrid	Bottom	n'L	Decay	\Delta E	\Delta E	\Delta E / \Delta E	INT	\Delta / m_q	<H_r>	\Delta E	\Delta E	\Delta E
nL_J	E/E	n'L	MeV	MeV	MeV	1/GeV			GeV^-1	GeV^-1	GeV^-1	GeV^-1
\$1p\_1\$	10772	\$1s\$	9551	1221	0.364	0.333	1.027	0.250	0.724	0.593	1.21	0.155
	\$2s\$	10017	755	0.491	0.333	-2.473	0.155	1.078	1.428	2.45	0.165	96
	\$3s\$	10355	417	0.976	0.333	1.496	0.085	0.360	0.864	3.43	0.281	12
	\$4s\$	10643	129	1.000	0.333	-0.220	0.026	0.016	0.127	4.29	0.704	0
	\$1d\$	10106	666	0.544	0.667	2.700	0.136	1.468	2.204	2.62	0.137	174
	\$2d\$	10416	356	1.000	0.667	-1.465	0.073	0.426	1.196	3.55	0.263	14
	\$3d\$	10689	83	1.000	0.667	0.160	0.017	0.011	0.131	4.38	0.702	0
	\$4d\$	10939										
\$2p\_1\$	10995	\$1s\$	9551	1444	0.334	0.333	0.659	0.296	0.550	0.381	1.21	0.256
	\$2s\$	10017	978	0.412	0.333	0.459	0.200	0.259	0.265	2.45	0.413	6
	\$3s\$	10355	640	0.564	0.333	-3.294	0.131	1.217	1.902	3.43	0.250	119
	\$4s\$	10643	352	1.000	0.333	2.338	0.072	0.475	1.350	4.29	0.344	18
	\$1d\$	10106	889	0.438	0.667	-0.175	0.182	0.127	0.143	2.62	0.595	1.4
	\$2d\$	10416	579	0.622	0.667	3.458	0.119	1.635	2.823	3.55	0.214	214
	\$3d\$	10689	306	1.000	0.667	-2.244	0.063	0.561	1.832	4.38	0.323	21
	\$4d\$	10939	56	0.000	0.667	0.260	0.011	0.012	0.212	5.14	0.650	0
\$3p\_1\$	11209	\$1s\$	9551	1658	0.314	0.333	0.412	0.340	0.394	0.238	1.21	0.384
	\$2s\$	10017	1192	0.368	0.333	0.605	0.244	0.416	0.349	2.45	0.408	17
	\$3s\$	10355	854	0.450	0.333	0.123	0.175	0.061	0.071	3.43	1.039	0.3
	\$4s\$	10643	566	0.637	0.333	-3.917	0.116	1.280	2.261	4.29	0.333	131
	\$1d\$	10106	1103	0.384	0.667	-0.285	0.226	0.256	0.232	2.62	0.502	6
	\$2d\$	10416	793	0.474	0.667	-0.055	0.163	0.036	0.045	3.55	1.454	0.11
	\$3d\$	10689	520	0.702	0.667	4.093	0.107	1.738	3.342	4.38	0.288	245
	\$4d\$	10939	270	1.000	0.667	-2.922	0.055	0.644	2.385	5.14	0.387	25

Decay for spin conserved transitions										green:		\Delta E > 800		&	<i r f>\Delta E < 1						
Hybrid	Charm			Decay							\Delta E	\alpha	C+^2	C-^2	INT+	INT-	\Delta/mq	<H r S>\Delta E	<f r f>	GeV	\Gamma
	nL_J	E/{E}	n'L'	E'	\Delta E	\alpha \Delta E	C+^2	C-^2	1/GeV	1/GeV											
\$1(s/d)_-1\$	4028	\$1p\$	3457	571	0.63	0.40	1.00	-0.64	-2.95	0.39	1.92							232			
		\$2p\$	3958	70	0.00	0.40	1.00	0.53	0.97	0.05	0.09							0			
		\$3p\$	4388																		
		\$4p\$	4774																		
		\$1f\$	4029																		
		\$2f\$	4441																		
		\$3f\$	4817																		
		\$4f\$	5807																		
\$2(s/d)_-1\$	4394	\$1p\$	3457	937	0.42	0.40	1.00	1.35	0.87	0.64	1.62		3.14				115	0.15	0.60	0.036	2.07
		\$2p\$	3958	436	0.90	0.40	1.00	-2.12	-3.88	0.30	2.28						280				
		\$3p\$	4388	6	0.00	0.40	1.00	0.88	1.36	0.00	0.01						0				
		\$4p\$	4774																		
		\$1f\$	4029	365	1.00	0.60		2.42		0.25	0.68						38				
\$3(s/d)_-1\$	4678	\$1p\$	3457	1221	0.36	0.40	1.00	2.92	-1.05	0.83	0.98		3.14				664	0.11	0.44	0.044	1.59
		\$2p\$	3958	720	0.51	0.40	1.00	-2.16	2.25	0.49	0.63						293				
		\$3p\$	4388	290	1.00	0.40	1.00	-0.48	-1.08	0.20	0.40						7				
		\$4p\$	4774																		
		\$1f\$	4029	649	0.56	0.60		3.62		0.44	1.82						266				
		\$2f\$	4441	237	1.00	0.60		0.59		0.16	0.11						1				
		\$3f\$	4817																		
		\$4f\$	5807																		

Decay for spin conserved transitions										green:		\Delta E > 800		&	<i r f>\Delta E < 1						
Hybrid	Bottom			Decay							\Delta E	\alpha	C+	C-	INT+	INT-	\Delta/mq	<H r S>\Delta E	<f r f>	\cal{V}/m	\Gamma
	nL_J	E/{E}	n'L'	E'	\Delta E	\alpha \Delta E	C+	C-	1/GeV	1/GeV											
\$1(s/d)_-1\$	10704	\$1p\$	9879	825	0.460	0.4	1.0	-0.478	-1.979	0.172	1.882	2.281	1.985	0.088			230				
		\$2p\$	10234	470	0.804	0.4	1.0	0.591	1.226	0.098	0.752	1.599	3.030	0.107			30				
		\$3p\$	10532	172	1.000	0.4	1.0	-0.151	-0.166	0.036	0.045	0.261	3.923	0.125			0				
		\$4p\$	10798																		
		\$1f\$	10297	407	1.000	0.6		-0.757		0.085	0.239	0.586	3.177	0.112			5				
		\$2f\$	10579	125	1.000	0.6		0.167		0.026	0.016	0.129	4.030	0.129			0				
		\$3f\$	10835																		
		\$4f\$	11072																		
\$2(s/d)_-1\$	10905	\$1p\$	9879	1026	0.400	0.4	1.0	0.680	0.022	0.214	0.464	0.452	1.985	1.985			18				
		\$2p\$	10234	671	0.541	0.4	1.0	-1.492	-2.441	0.140	2.271	3.385	3.030	3.030			249				
		\$3p\$	10532	373	1.000	0.4	1.0	1.064	1.760	0.078	0.908	2.433	3.923	3.923			41				
		\$4p\$	10798	107	1.000	0.4	1.0	-0.199	-0.236	0.022	0.039	0.363	4.725	4.725			0				
		\$1f\$	10297	608	0.592	0.6		1.544		0.127	0.727	1.196	3.177	3.177			42				
		\$2f\$	10579	326	1.000	0.6		-1.201		0.068	0.303	0.930	4.030	4.030			7				
		\$3f\$	10835	70	0.000	0.6		0.192		0.015	0.010	0.149	4.809	4.809			4				
		\$4f\$	11072	31	0.000	0.6		0.145		0.006	0.003	0.112	5.535	0.242			0				

Decay for spin flipped transition Hybrid spin 0										green: \D E>800 &		<i f>\DE<1 &		<i r f>\DE<2		
Hybrid	Charm		Decay													
nL_J	E/{E}	n'L'	E'	\D E	\a (\D E K^2	INT<>	INT<r>	<H S>\D E/m	<i r f>\DE	<i r f>	<f r f>	\calV/m	\Gamma			
	MeV		MeV	MeV		1/GeV				GeV^-1	GeV^-1		MeV			
\$1p_0\$	4455	\$1p\$	3457	998	0.407	0.33	0.988	3.269	0.387	3.262	3.269	3.141	0.760	14		
		\$1p\$	3457	998	0.407	1.00	0.988	3.269	0.671	3.262	3.269	3.141	0.760	41		
		\$1p\$	3457	998	0.407	1.67	0.988	3.269	0.866	3.262	3.269	3.141	0.760	68		
		\$2p\$	3958	497	0.744	3	-0.143		0.084			4.658	0.862	1		
		\$3p\$	4388	67	0.000	3	-0.035		0.003			5.969	0.955	0		
		\$4p\$	4774													
\$2p_0\$	4917	\$1p\$	3457	1460	0.333	3	0.135	-0.562	0.233	0.820	0.562	3.141	1.074	6		
		\$2p\$	3958	959	0.417	0.33	0.977	4.637	0.368	4.447	4.637	4.658	1.176	12		
		\$2p\$	3958	959	0.417	1.00	0.977	4.637	0.637	4.447	4.637	4.658	1.176	36		
		\$2p\$	3958	959	0.417	1.67	0.977	4.637	0.823	4.447	4.637	4.658	1.176	60		
		\$3p\$	4388	529	0.688	3	-0.133		0.083		0.000	5.969	1.269	1		
		\$4p\$	4774	143	1.000	3	-0.032		0.005		0.000	7.153	1.354	0		
\$3p_0\$	5315	\$1p\$	3457	1858	0.299	3	0.050	-0.202	0.109	0.375	0.202	3.141	1.345	1.5		
		\$2p\$	3958	1357	0.345	3	0.113	-0.908	0.181	1.233	0.908	4.658	1.447	3		
		\$3p\$	4388	927	0.426	0.33	0.962	5.995	0.350	5.558	5.995	5.969	1.540	11		
		\$3p\$	4388	927	0.426	1.00	0.962	5.995	0.606	5.558	5.995	5.969	1.540	32		
		\$3p\$	4388	927	0.426	1.67	0.962	5.995	0.783	5.558	5.995	5.969	1.540	54		
		\$4p\$	4774	541	0.670	3	-0.222		0.141		0.000	7.153	1.625	2		

Decay for spin flipped transition Hybrid spin 0										green: \D E>800 &		<i f>\DE<1 &		<i r f>\DE<2		
Hybrid	Bottom		Decay													
nL_J	E/{E}	n'L'	E'	\D E	\a (\D E K^2	INT	INT<r>	<H S>\D E/m	<i r f>\DE	<i r f>	<f r f>	\calV/m	\Gamma			
	MeV		MeV	MeV		1/GeV				GeV^-1	GeV^-1		MeV			
\$1p_0\$	10977	\$1p\$	9879	1098	0.385	3	0.960	2.101	0.374	2.307	2.101	1.985	0.144	13		
		\$2p\$	10234	743	0.497	3	-0.274		0.072		0.000	3.030	0.162	0		
		\$3p\$	10532	445	0.874	3	-0.032		0.005		0.000	3.923	0.180	0		
		\$4p\$	10798	179	1.000	3	-0.018		0.001		0.000	4.725	0.198	0		
	\$2p_0\$	11261	\$1p\$	9879	1382	0.341	3	0.242	-0.056	0.119	0.078	0.056	1.985	0.203	1.5	
		\$2p\$	10234	1027	0.400	3	0.896	2.927	0.327	3.006	2.927	3.030	0.221	10		
		\$3p\$	10532	729	0.505	3	-0.357		0.092		0.000	3.923	0.239	1		
		\$4p\$	10798	463	0.822	3	-0.047		0.008		0.000	4.725	0.256	0		
\$3p_0\$	11525	\$1p\$	9879	1646	0.315	3	0.110	-0.112	0.064	0.185	0.112	1.985	0.257	0.5		
		\$2p\$	10234	1291	0.353	3	0.295	0.051	0.135	0.066	0.051	3.030	0.275	2		
		\$3p\$	10532	993	0.408	3	0.875	3.579	0.308	3.554	3.579	3.923	0.293	9		
		\$4p\$	10798	727	0.506	3	-0.332		0.086		0.000	4.725	0.310	1		

Decay for spin flipped transition Hybrid spin 0										green: $\langle i f\rangle \Delta E>800$ & $\langle i r f\rangle \Delta E<1$ & $\langle i r f\rangle \Delta E<2$				
Hybrid		Charm		Decay										
nL_J	E/{E}	n'L'	E'	\Delta E	\alpha (\Delta E)	K^2	INT<>	iNT<r>	<H S> \Delta E/m	\langle i r f\rangle \Delta E	\langle i r f\rangle	\langle f f\rangle	\langle calV/m	\Gamma
\$1p\_1\$	4171	\$1p\$	3457	714	0.513	0.33	0.944	3.318	0.265	2.369	3.318	3.141	0.567	6
		\$1p\$	3457	714	0.513	1.00	0.944	3.318	0.459	2.369	3.318	3.141	0.567	17
		\$1p\$	3457	714	0.513	1.67	0.944	3.318	0.592	2.369	3.318	3.141	0.567	29
		\$2p\$	3958	213	1.000	3	-0.326		0.082		0.000	4.658	0.669	0
		\$3p\$	4388											
		\$4p\$	4774											
\$2p\_1\$	4556	\$1p\$	3457	1099	0.385	3	0.291	0.118	0.376	0.129	0.118	3.141	0.829	13
		\$2p\$	3958	598	0.601	3	0.864		0.609		0.000	4.658	0.931	30
		\$3p\$	4388	168	1.000	3	-0.402		0.080		0.000	5.969	1.024	0
		\$4p\$	4774											
\$3p\_1\$	4912	\$1p\$	3457	1455	0.333	3	0.124	-0.123	0.213	0.178	0.123	3.141	1.071	5
		\$2p\$	3958	954	0.418	3	0.326	0.314	0.366	0.300	0.314	4.658	1.173	12
		\$3p\$	4388	524	0.695	3	0.819		0.505		0.000	5.969	1.266	21
		\$4p\$	4774	138	1.000	3	-0.443		0.072		0.000	7.153	1.351	0

Decay for spin flipped transition Hybrid spin 0										green: $\langle i f\rangle \Delta E>800$ & $\langle i r f\rangle \Delta E<1$ & $\langle i r f\rangle \Delta E<2$				
Hybrid		Bottom		Decay										
nL_J	E/{E}	n'L'	E'	\Delta E	\alpha (\Delta E)	K^2	INT	iNT<r>	<H S> \Delta E/m	\langle i r f\rangle \Delta E	\langle i r f\rangle	\langle f f\rangle	\langle calV/m	\Gamma
\$1p\_1\$	10772	\$1p\$	9879	893	0.436	3	0.847	2.029	0.269	1.812	2.029	3.141	0.042	6
		\$2p\$	10234	538	0.674	3	-0.525		0.100		0.000	4.658	0.043	1
		\$3p\$	10532	240	1.000	3	0.063		0.005		0.000	5.969	0.044	0
		\$4p\$	10798											
	10995	\$1p\$	9879	1116	0.382	3	0.438	0.553	0.173	0.617	0.553	3.141	0.088	3
		\$2p\$	10234	761	0.488	3	0.630		0.170		0.000	4.658	0.089	2
\$2p\_1\$	11209	\$1p\$	9879	1330	0.348	3	0.235	0.126	0.111	0.168	0.126	3.141	0.132	1.3
		\$2p\$	10234	975	0.413	3	0.441	0.838	0.153	0.818	0.838	4.658	0.133	2.1
		\$3p\$	10532	677	0.536	3	0.512		0.123		0.000	5.969	0.134	1
		\$4p\$	10798	411	1.000	3	-0.681		0.099		0.000	7.153	0.135	1

Decay for spin flipped transitions				Hybrid spin 0		green: \D E>800 &		<i f>\DE<1 &		<i r f>\DE<2					
Hybrid		Charm		Decay											
nL_J	E/{E}	n'L'	E'	\D E	\a (\D f K^2	INT+	INT-	INT<r>INT<r>-	<H S>\D E/m	<i r f>\DE	<i r f>	<f r f>	\calV/m	\Gamma	
				MeV	MeV	1/GeV	1/GeV			GeV^-1	GeV^-1			MeV	
\$1(s/d)_1\$	4028	\$1s\$	3068	960	0.42	3.00		-0.91	-2.21	1.03	2.12	2.207	2.06	0.391	94
		\$2s\$	3674	354	1.00	3.00		0.37		0.15		0.000	3.84	0.506	2
		\$3s\$	4149												
		\$4s\$	4562												
		\$1d\$	3762	266	1.00	3.00	-0.19			0.06		0.000	4.05	0.533	0
		\$2d\$	4209												
		\$3d\$	4608												
		\$4d\$	4974												
\$2(s/d)_1\$	4394	\$1s\$	3068	1326	0.35	3.00		-0.36	-0.25	0.56	0.33	0.246	2.06	0.640	33
		\$2s\$	3674	720	0.51	3.00		-0.69		0.59		0.000	3.84	0.755	28
		\$3s\$	4149	245	1.00	3.00		0.39		0.11		0.000	5.27	0.857	1
		\$4s\$	4562												
		\$1d\$	3762	632	0.57	3.00	0.42			0.31		0.000	4.05	0.782	8
		\$2d\$	4209	185	1.00	3.00	-0.24			0.05		0.000	5.41	0.876	0
		\$3d\$	4608												
		\$4d\$	4974												
\$3(s/d)_1\$	4678	\$1s\$	3068	1610	0.32	3.00		-0.03	-0.35	0.05	0.57	0.354	2.06	0.833	0.3
		\$2s\$	3674	1004	0.41	3.00		0.40	1.89	0.48	1.90	1.891	3.84	0.948	21
		\$3s\$	4149	529	0.69	3.00		-0.24		0.15		0.000	5.27	1.050	2
		\$4s\$	4562	116	1.00	3.00		0.03		0.00		0.000	6.53	1.141	0
		\$1d\$	3762	916	0.43	0.60	0.88		3.54	0.42	3.24	3.537	4.05	0.975	16
		\$1d\$	3762	916	0.43	1.00	0.88		3.54	0.55	3.24	3.537	4.05	0.975	26
		\$1d\$	3762	916	0.43	1.40	0.88		3.54	0.65	3.24	3.537	4.05	0.975	37
		\$2d\$	4209	469	0.81	3.00	0.03			0.02		0.000	5.41	1.069	0
		\$3d\$	4608	70	0.00	3.00	-0.06			0.01		0.000	6.63	1.157	0
		\$4d\$	4974												

Decay for spin flipped transitions				Hybrid spin 0		green: \D E>800 &		<i f>\DE<1 &		<i r f>\DE<2						
Hybrid		Bottom		Decay												
nL_J	E/{E}	n'L'	E'	\D E	\a (\D f K^2	INT+	INT-	INT<r>INT<r>-	<H S>\D E/m	<i r f>\DE	<i r f>	<f r f>	\calV/m	\Gamma		
		MeV	MeV	1/GeV	1/GeV					GeV^-1	GeV^-1			MeV		
\$1(s/d)_1\$	10704	\$1s\$	9551	1153	0.37	3.00		-0.77	-1.24	0.32	1.43	1.238	1.21	0.071	9.65	
		\$2s\$	10017	687	0.53	3.00		0.58		0.14		0.000	2.45	0.091	1.61	
		\$3s\$	10355	349	1.00	3.00		-0.07		0.01		0.000	3.43	0.112	0.01	
		\$4s\$	10643	61	0.00	3.00		0.02		0.00		0.000	4.29	0.130	0.00	
		\$1d\$	10106	598	0.60	3.00	-0.23			0.05		0.000	2.62	0.101	0.20	
		\$2d\$	10416	288	1.00	3.00	0.07			0.01		0.000	3.55	0.119	0.00	
		\$3d\$	10689	15	0.00	3.00	0.00			0.00		0.000	4.38	0.135	0.00	
		\$4d\$	10939													
\$2(s/d)_1\$	10905	\$1s\$	9551	1354	0.34	3.00		-0.49	-0.48	0.24	0.65	0.481	1.21	0.112	5.74	
		\$2s\$	10017	888	0.44	3.00		-0.41	-1.23	0.13	1.09	1.232	2.45	0.133	1.43	
		\$3s\$	10355	550	0.66	3.00		0.59		0.12		0.000	3.43	0.153	1.07	
		\$4s\$	10643	262	1.00	3.00		-0.08		0.01		0.000	4.29	0.171	0.00	
		\$1d\$	10106	799	0.47	3.00	0.35			0.10		0.000	2.62	0.142	0.82	
		\$2d\$	10416	489	0.76	3.00	-0.33			0.06		0.000	3.55	0.160	0.26	
		\$3d\$	10689	216	1.00	3.00	0.07			0.01		0.000	4.38	0.177	0.00	
		\$4d\$	10939													
\$3(s/d)_1\$	11103	\$1s\$	9551	1552	0.32	3.00		-0.18	-0.17	0.10	0.26	0.167	1.21	0.153	1.04	
		\$2s\$	10017	1086	0.39	3.00		-0.02	0.28	0.01	0.30	0.277	2.45	0.173	0.007	
		\$3s\$	10355	748	0.49	3.00		-0.40		0.11		0.000	3.43	0.194	0.95	
		\$4s\$	10643	460	0.83	3.00		0.45		0.07		0.000	4.29	0.212	0.46	
		\$1d\$	10106	997	0.41	3.00	0.70		1.79		0.25	1.78	1.789	2.62	0.183	5.56
		\$2d\$	10416	687	0.53	3.00	0.13				0.03		0.000	3.55	0.200	0.08
		\$3d\$	10689	414	0.99	3.00	-0.29				0.04		0.000	4.38	0.217	0.16
		\$4d\$	10939	164	1.00	3.00	0.04				0.00		0.000	5.14	0.233	0.00

Decay for spin flipped transitions				Hybrid spin 1			green: $\backslash D E > 800$ &			$\langle i f\rangle \backslash DE < 1$ &			$\langle i r f\rangle \backslash DE < 2$		
Hybrid	Charm Decay			$\backslash D E$	$\backslash a (\backslash D E)$	$K^2$	INT	int< $r$ >	$\langle H S \rangle \backslash D E / m$	$\langle i r f\rangle \backslash DE$	$\langle i r f\rangle$	$\langle f r f\rangle$	$\backslash calV/m$	$\backslash Gamma$	
nL_J	E/{E}	n'L'	E'	MeV	MeV	MeV		1/GeV		GeV^-1	GeV^-1		MeV	MeV	
\$1p_0\$	4455	\$1p\$	3457	998	0.407	1	0.988	3.269	0.671	3.262	3.269	3.141	0.760	41	
		\$2p\$	3958	497	0.744	1	-0.143			0.000	4.658	0.862			
		\$3p\$	4388	67	0.000	1	-0.035			0.000	5.969	0.955			
		\$4p\$	4774												
\$2p_0\$	4917	\$1p\$	3457	1460	0.333	1	0.135	-0.562	0.135	0.820	0.562	3.141	1.074	2.0	
		\$2p\$	3958	959	0.417	1	0.977	4.637	0.637	4.447	4.637	4.658	1.176	36	
		\$3p\$	4388	529	0.688	1	-0.133			0.000	5.969	1.269			
		\$4p\$	4774	143	1.000	1	-0.032			0.000	7.153	1.354			
\$3p_0\$	5315	\$1p\$	3457	1858	0.299	1	0.050	-0.202	0.063	0.375	0.202	3.141	1.345	0.5	
		\$2p\$	3958	1357	0.345	1	0.113	-0.908	0.105	1.233	0.908	4.658	1.447	1.1	
		\$3p\$	4388	927	0.426	1	0.962	5.995	0.606	5.558	5.995	5.969	1.540	32	
		\$4p\$	4774	541	0.670	1	-0.222		0.082		0.000	7.153	1.625		

Decay for spin flipped transitions				Hybrid spin 1			green: $\backslash D E > 800$ &			$\langle i f\rangle \backslash DE < 1$ &			$\langle i r f\rangle \backslash DE < 2$		
Hybrid	Bottom Decay			$\backslash D E$	$\backslash a (\backslash D E)$	$K^2$	INT	int< $r$ >	$\langle H S \rangle \backslash D E / m$	$\langle i r f\rangle \backslash DE$	$\langle i r f\rangle$	$\langle f r f\rangle$	$\backslash calV/m$	$\backslash Gamma$	
nL_J	E/{E}	n'L'	E'	MeV	MeV	MeV		1/GeV		GeV^-1	GeV^-1		MeV	MeV	
\$1p_0\$	10977	\$1p\$	9879	1098	0.385	1	0.960	2.101	0.216	2.307	2.101	1.985	0.144	4.4	
		\$2p\$	10234	743	0.497	1	-0.274	-1.438	0.042	1.068	1.438	3.030	0.162	0.1	
		\$3p\$	10532	445	0.874	1	-0.032			0.000	3.923	0.180			
		\$4p\$	10798	179	1.000	1	-0.018			0.000	4.725	0.198			
\$2p_0\$	11261	\$1p\$	9879	1382	0.341	1	0.242	-0.056	0.069	0.078	0.056	1.985	0.203	0.5	
		\$2p\$	10234	1027	0.400	1	0.896	2.927	0.189	3.006	2.927	3.030	0.221	3.2	
		\$3p\$	10532	729	0.505	1	-0.357	-2.268	0.053	1.653	2.268	3.923	0.239	0.2	
		\$4p\$	10798	463	0.822	1	-0.047			0.000	4.725	0.256			
\$3p_0\$	11525	\$1p\$	9879	1646	0.315	1	0.110	-0.112	0.037	0.185	0.112	1.985	0.257	0.2	
		\$2p\$	10234	1291	0.353	1	0.295	0.051	0.078	0.066	0.051	3.030	0.275	0.6	
		\$3p\$	10532	993	0.408	1	0.875	3.579	0.178	3.554	3.579	3.923	0.293	2.9	
		\$4p\$	10798	727	0.506	1	-0.332			0.000	4.725	0.310			

Decay for spin flipped transition Hybrid spin 1								green: \D E>800 &		<i f>\DE<1 &		<i r f>\DE<2							
Hybrid	Charm		Decay		nL_J	E/{E}	n'L'	E'	\D E	\a (\D E)	K^2	INT	int<r>	<H S>\D E/m	<i r f>\DE	<i r f> GeV^-1	<f r f> GeV^-1	\calV/m	\Gamma
					MeV	MeV	MeV	MeV	MeV	1/GeV							MeV		
\$1p\_1\$	4171	\$1p\$	3457	714	0.513	1	0.944	3.318	0.459	2.369	3.318	3.141	0.567	17					
		\$2p\$	3958	213	1.000	1	-0.326		0.047		0.000	4.658	0.669	0					
		\$3p\$	4388																
		\$4p\$	4774																
\$2p\_1\$	4556	\$1p\$	3457	1099	0.385	1	0.291	0.118	0.217	0.129	0.118	3.141	0.829	4					
		\$2p\$	3958	598	0.601	1	0.864		0.352		0.000	4.658	0.931	10					
		\$3p\$	4388	168	1.000	1	-0.402		0.046		0.000	5.969	1.024	0					
		\$4p\$	4774																
\$3p\_1\$	4912	\$1p\$	3457	1455	0.333	1	0.124	-0.123	0.123	0.178	0.123	3.141	1.071	1.6					
		\$2p\$	3958	954	0.418	1	0.326	0.314	0.211	0.300	0.314	4.658	1.173	4					
		\$3p\$	4388	524	0.695	1	0.819		0.292		0.000	5.969	1.266	7					
		\$4p\$	4774	138	1.000	1	-0.443		0.042		0.000	7.153	1.351	0					
Decay for spin flipped transition Hybrid spin 1								green: \D E>800 &		<i f>\DE<1 &		<i r f>\DE<2							
Hybrid	Bottom		Decay		nL_J	E/{E}	n'L'	E'	\D E	\a (\D E)	K^2	INT	int<r>	<H S>\D E/m	<i r f>\DE	<i r f> GeV^-1	<f r f> GeV^-1	\calV/m	\Gamma
					MeV	MeV	MeV	MeV	MeV	1/GeV							MeV		
\$1p\_1\$	10772	\$1p\$	9879	893	0.436	1	0.847	2.029	0.155	1.812	2.029	1.985	0.102	2.1					
		\$2p\$	10234	538	0.674	1	-0.525		0.058		0.000	3.030	0.120	0.3					
		\$3p\$	10532	240	1.000	1	0.063		0.003		0.000	3.923	0.138	0.0					
		\$4p\$	10798																
\$2p\_1\$	10995	\$1p\$	9879	1116	0.382	1	0.438	0.553	0.100	0.617	0.553	1.985	0.148	0.9					
		\$2p\$	10234	761	0.488	1	0.630		0.098		0.000	3.030	0.166	0.8					
		\$3p\$	10532	463	0.822	1	-0.630		0.060		0.000	3.923	0.184	0.3					
		\$4p\$	10798	197	1.000	1	0.087		0.004		0.000	4.725	0.201	0.0					
\$3p\_1\$	11209	\$1p\$	9879	1330	0.348	1	0.235	0.126	0.064	0.168	0.126	1.985	0.192	0.4					
		\$2p\$	10234	975	0.413	1	0.441	0.838	0.088	0.818	0.838	3.030	0.210	0.7					
		\$3p\$	10532	677	0.536	1	0.512		0.071		0.000	3.923	0.228	0.4					
		\$4p\$	10798	411	1.000	1	-0.681		0.057		0.000	4.725	0.245	0.3					

Decay for spin fliped transitions			Hybrid spin 1			green: \D E>800 &		<i f>\DE<1 &		<i r f>\DE<2								
Hybrid	Charm		Decay			\D E	\a	\D E k^2	INT+	INT-	int< r >+	int< r >-	<H S>\D E/m	<i r f>\DE	<i r f>	<f r f>	\cal V/m	\Gamma
nL_J	E/{E}	n'L'	E'	\D E	MeV	MeV	MeV	1/GeV	1/GeV						GeV^-1	GeV^-1	MeV	
\$1(s/d)_1\$	4028	\$1s\$	3068	960	0.42	1		-0.91			-2.21		0.59	2.12	2.207	2.06	0.391	31
		\$2s\$	3674	354	1.00	1		0.37			0.09		0.000	3.84	0.506		1	
		\$3s\$	4149															
		\$4s\$	4562															
		\$1d\$	3762	266	1.00	1	-0.19				0.04		0.000	4.05	0.533		0	
		\$2d\$	4209															
		\$3d\$	4608															
		\$4d\$	4974															
\$2(s/d)_1\$	4394	\$1s\$	3068	1326	0.35	1		-0.36		-0.25	0.33	0.33	0.246	2.06	0.640		11	
		\$2s\$	3674	720	0.51	1		-0.69			0.34		0.000	3.84	0.755		9	
		\$3s\$	4149	245	1.00	1		0.39			0.06		0.000	5.27	0.857		0	
		\$4s\$	4562															
		\$1d\$	3762	632	0.57	1	0.42			0.18		0.000	4.05	0.782		3		
		\$2d\$	4209	185	1.00	1	-0.24			0.03		0.000	5.41	0.876		0		
		\$3d\$	4608															
		\$4d\$	4974															
\$3(s/d)_1\$	4678	\$1s\$	3068	1610	0.32	1		-0.03		-0.35	0.03	0.57	0.354	2.06	0.833		0.11	
		\$2s\$	3674	1004	0.41	1		0.40		1.89	0.28	1.90	1.891	3.84	0.948		7	
		\$3s\$	4149	529	0.69	1		-0.24			0.09		0.000	5.27	1.050		1	
		\$4s\$	4562	116	1.00	1		0.03			0.00		0.000	6.53	1.141		0	
		\$1d\$	3762	916	0.43	1	0.88			3.54	0.55	3.24	3.537	4.05	0.975		26	
		\$2d\$	4209	469	0.81	1	0.03				0.01		0.000	5.41	1.069		0	
		\$3d\$	4608	70	0.00	1	-0.06				0.00		0.000	6.63	1.157		0	
		\$4d\$	4974															

Decay for spin fliped transitions			Hybrid spin 1			green: \D E>800 &		<i f>\DE<1 &		<i r f>\DE<2								
Hybrid	Bottom		Decay			\D E	\a	\D E k^2	INT+	INT-	int< r >+	int< r >-	<H S>\D E/m	<i r f>\DE	<i r f>	<f r f>	\cal V/m	\Gamma
nL_J	E/{E}	n'L'	E'	\D E	MeV	MeV	MeV	1/GeV	1/GeV						GeV	GeV	GeV	MeV
\$1(s/d)_1\$	10704	\$1s\$	9551	1153	0.375	1		-0.774		-1.238	0.183	1.428	1.238	1.21	0.071		3.2	
		\$2s\$	10017	687	0.530	1		0.578			0.081		0.000	2.45	0.091		0.5	
		\$3s\$	10355	349	1.000	1		-0.068			0.005		0.000	3.43	0.112		0.0	
		\$4s\$	10643	61	0.000	1		0.018			0.000		0.000	4.29	0.130		0.0	
		\$1d\$	10106	598	0.601	1	-0.233				0.029		0.000	2.62	0.101		0.1	
		\$2d\$	10416	288	1.000	1	0.066				0.004		0.000	3.55	0.119		0.0	
		\$3d\$	10689	15	0.000	1	0.005				0.000		0.000	4.38	0.135		0.0	
		\$4d\$	10939															
\$2(s/d)_1\$	10905	\$1s\$	9551	1354	0.345	1		-0.489		-0.481	0.136	0.651	0.481	1.21	0.112		1.9	
		\$2s\$	10017	888	0.438	1		-0.408		-1.232	0.074	1.094	1.232	2.45	0.133		0.5	
		\$3s\$	10355	550	0.657	1		0.593			0.067		0.000	3.43	0.153		0.4	
		\$4s\$	10643	262	1.000	1		-0.084			0.004		0.000	4.29	0.171		0.0	
		\$1d\$	10106	799	0.471	1	0.348				0.057		0.000	2.62	0.142		0.3	
		\$2d\$	10416	489	0.760	1	-0.325				0.033		0.000	3.55	0.160		0.1	
		\$3d\$	10689	216	1.000	1	0.066				0.003		0.000	4.38	0.177		0.0	
		\$4d\$	10939															
\$3(s/d)_1\$	11103	\$1s\$	9551	1552	0.323	1		-0.175		-0.167	0.056	0.259	0.167	1.21	0.153		0.3	
		\$2s\$	10017	1086	0.387	1		-0.023		0.277	0.005	0.300	0.277	2.45	0.173		0.0	
		\$3s\$	10355	748	0.495	1		-0.405			0.062		0.000	3.43	0.194		0.3	
		\$4s\$	10643	460	0.830	1		0.449			0.042		0.000	4.29	0.212		0.2	
		\$1d\$	10106	997	0.407	1	0.702			1.789	0.143	1.784	1.789	2.62	0.183		1.9	
		\$2d\$	10416	687	0.530	1	0.131				0.018		0.000	3.55	0.200		0.0	
		\$3d\$	10689	414	0.989	1	-0.286				0.024		0.000	4.38	0.217		0.1	
		\$4d\$	10939	164	1.000	1	0.042				0.001		0.000	5.14	0.233		0.0	

```
Function als(x As Double) As Double
    ' Calculates the alphasB formula for given x, clamped between 0 and 1
    Dim val As Double
```

```
' Original formula
val = 0.175082 - 0.000774928 / x ^ 6 + 0.0128554 / x ^ 5 - 0.0479785 / x ^ 4 +_
    0.111682 / x ^ 3 - 0.120244 / x ^ 2 + 0.278722 / x - 0.00282622 * x
```

```
' Clamp the result between 0 and 1
If val < 0 Then
    als = 0.0001
ElseIf val > 1 Then
    als = 1
Else
    als = val
End If
End Function
```

```
Function das(x As Double) As Double
    das = (als(x / 2) - als(2 * x)) / 2
End Function
```

```
Function VgC(x As Double) As Double
    sigma = 0.215
    kappa = 0.240
    Egc = -0.028-0.428
    mc = 1.47
    VgC = sigma * x - kappa / x + 2 * mc + Egc
End Function
```

```
Function VgB(x As Double) As Double
    sigma = 0.215
    kappa = 0.240
    Egc = -0.028-0.423
    mb = 4.88
    VgB = sigma * x - kappa / x + 2 * mb + Egc
End Function
```

#### 1. Activa la pestanya Desenvolupador

Ves a **Fitxer → Opcions → Personalitza la cinta d'opcions.**  
A la llista de la dreta, marca **Desenvolupador**.  
Prem **D'acord** → ara et sortirà la pestanya **Desenvolupador** a la cinta de menús.

#### 2. Obre l'editor de VBA

A la pestanya **Desenvolupador**, fes clic a **Visual Basic**.  
**3. Crear un mòdul nou**

A l'editor de VBA, ves al menú **Inserir → Mòdul**.

→ Et sortirà un full en blanc on pots escriure codi.

#### 4. Notes importants

Desa el fitxer **ctrl+s**

#### Ves a la pestanya Fòrmules

A la part dreta hi ha el grup **Opcions de càlcul** → fes clic a **Calcula ara (Calculate Now)**  
→ això és el mateix que F9.