^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. C. Batchelder and A. M. Hurst, M. S. Basunia	NDS 183, 1 (2022)	1-Mar-2022

1992Po01: E=135-150 MeV; 12-detector array of Compton-suppressed Ge detectors; measured Eγ, DCO ratios, $\gamma\gamma$ coin, $\gamma(\theta)$, γ linear polarization.

1973Pr16: E=135 MeV; measured Eγ, Iγ, $\gamma(\theta)$ (θ=0°, 45°, 90°), $\gamma\gamma$ coin; determined relative Iγ for g.s. band transitions, both in-beam (for J≤14 band members) and for 100 μs isomeric state decay (for J≤8 band members).

^{186}Hg Levels

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	Comments
0.0[#]	0^+		
405[#]	2^+		
620[@]	2^+		
807[@]	4^+		
1080[#]	4^+		
1165[@]	6^+		
1228[a]	3^-		J$^{\pi}$: Assumes mult(607)=E1 determined in Tl ε decay; however 607γ is a doublet in (HI,xnγ). (4^+) in Adopted Levels.
1577[a]	(5^-)		J$^{\pi}$: (6^+) in Adopted Level.
1589[@]	8^+		
1676[#]	(6^+)		
1868	5^+		
1906	(6^+)		
1975[a]	(7^-)		J$^{\pi}$: (8^+) in Adopted Levels.
2077[@]	10^+		
2154[#]	(8^+)		
2184[b]	(6^-)		J$^{\pi}$: $7^{(-)}$ in Adopted Levels. The 607 keV γ-ray de-exciting this state was shown to be D based on DCO ratios (1992Ra34, 2017MaZZ) De-excites to 1578 keV Level.
2217[c]	(8^-)	100 μs *10*	E(level): From 1992Po01. $T_{1/2}$: from 1973Pr16.
2266[e]			
2394[d]	(9^-)		
2427[a]	(9^-)		J$^{\pi}$: (10^+) in Adopted Levels.
2464[b]	(8^-)		J$^{\pi}$: $9^{(-)}$ in Adopted Levels.
2572[e]			
2592[c]	(10^-)		
2617[@]	12^+		
2635[#]	(10^+)		
2810[d]	(11^-)		
2833[f]	10^+		
2847[b]	(10^-)		J$^{\pi}$: $11^{(-)}$ in Adopted Levels.
2927[a]	(11^-)		J$^{\pi}$: (12^+) in Adopted Levels.
3015[e]			
3049[c]	(12^-)		
3088[&]	$11^{(-)}$		J$^{\pi}$: 11^- in Adopted Levels.
3198[@]	14^+		E(level): Assumed same as 3200.4 level in adopted.
3267[b]	(12^-)		J$^{\pi}$: $13^{(-)}$ in Adopted Levels.
3303[d]	(13^-)		

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^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16 (continued)

^{186}Hg Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
3314[f]		
3445[&]	13$^{(-)}$	
3470[a]	(13$^-$)	J$^{\pi}$: (14$^+$) in Adopted Levels.
3501[e]		
3582[c]	(14$^-$)	
3735[b]	(14$^-$)	J$^{\pi}$: 15$^{(-)}$ in Adopted Levels.
3808[@]	16$^+$	
3826[&]	15$^{(-)}$	
3872[d]	(15$^-$)	
3969[f]		
4039[e]		
4052[a]	(15$^-$)	J$^{\pi}$: (16$^+$) in Adopted Levels.
4182[c]	(16$^-$)	
4265[b]	(16$^-$)	J$^{\pi}$: 17$^{(-)}$ in Adopted Levels.
4267[&]	17$^{(-)}$	
4444[@]	18$^+$	
4500[d]	(17$^-$)	
4624[f]		
4640[e]		
4643[a]	(17$^-$)	J$^{\pi}$: (18$^+$) in Adopted Levels.
4774[&]	19$^{(-)}$	
4838[b]	(18$^-$)	J$^{\pi}$: 19$^{(-)}$ in Adopted Levels.
4856?[c]		E(level): Level not adopted, questionable level.
4866[g]		
5109[@]	20$^+$	
5218?[d]		E(level): Level not adopted, questionable level.
5267[a]	(19$^-$)	J$^{\pi}$: (20$^+$) in Adopted Levels.
5317[f]		
5341[&]	21$^{(-)}$	
5404[g]		
5429[b]	(20$^-$)	J$^{\pi}$: 21$^{(-)}$ in Adopted Levels.
5808[@]	22$^+$	
5962[&]	23$^{(-)}$	
6038[b]	(22$^-$)	J$^{\pi}$: 23$^{(-)}$ in Adopted Levels.
6547[@]	(24$^+$)	
6633[&]	(25$^-$)	
6680[b]	(24$^-$)	J$^{\pi}$: 25$^{(-)}$ in Adopted Levels.
7354[&]	(27$^-$)	

[†] From least-squares adjustment of Eγ, allowing equal weights for all Eγ values.

[‡] Authors′ values (1992Po01), based on unspecified DCO ratios, $\gamma(\theta)$ and linear polarization data, and by analogy with band structure in neighboring isotones. Note that, in the band which includes the 3088 level, the order of the 357γ-381γ cascade differs from what is proposed in (^{36}S,4nγ).

[#] Band(A): K$^{\pi}$=0$^+$ g.s. band. Slightly-deformed oblate band.

[@] Band(B): K$^{\pi}$=0$^+$ band. Prolate band.

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^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16 (continued)

^{186}Hg Levels (continued)

[&] Band(C): π=(−) ΔJ=2 band.
[a] Band(D): π=−, ΔJ=2 band. 607 keV γ transition de-exciting the 1228 level is assumed to be the γ from Tl ε decay which was determined to be E1. However 607γ is a doublet in (HI,xnγ), and the 607 γ de-exciting this level was shown to be an E2 in ^{154}Gd(^{36}S,4nγ) based on DCO ratios, resulting in an increase of 1 unit in spin and parity change in the Adopted Levels. See also the comment on this band in Adopted Levels.
[b] Band(E): High-K band. De-excites into Band D, J^{π} for levels in are adopted as one unit of spin higher in the Adopted Levels. See also the comment on this band in Adopted Levels. Possible configuration=(ν 9/2[624])(ν 1/2[521]). No connection observed to K=0 bands.
[c] Band(F): (ν 9/2[624])+(ν 7/2[514]) α=0 band.
[d] Band(G): (ν 9/2[624])+(ν 7/2[514]) α=1 band.
[e] Band(H): Collective band.
[f] Band(I): Possible collective band. Existence of band not confirmed in (^{36}S,4nγ) reaction.
[g] Band(J): Possible band fragment.

γ(^{186}Hg)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
177	2394	(9$^-$)	2217	(8$^-$)		
187	807	4$^+$	620	2$^+$		
198	2592	(10$^-$)	2394	(9$^-$)		
215	620	2$^+$	405	2$^+$		
218	2810	(11$^-$)	2592	(10$^-$)		
239	3049	(12$^-$)	2810	(11$^-$)		
254	3303	(13$^-$)	3049	(12$^-$)		
255	3088	11$^{(-)}$	2833	10$^+$	D	Mult.: From A_2<0 for 255$\gamma(\theta)$ (1992Po01).
278	3582	(14$^-$)	3303	(13$^-$)		
280	2464	(8$^-$)	2184	(6$^-$)		
290	3872	(15$^-$)	3582	(14$^-$)		
306	2572		2266			
349	1577	(5$^-$)	1228	3$^-$		
357	1165	6$^+$	807	4$^+$	Q	Iγ=76, A_2=+0.22 (1973Pr16). 356.7 keV (1973Pr16).
357	3445	13$^{(-)}$	3088	11$^{(-)}$		
360	2266		1906	(6$^+$)		
375	2592	(10$^-$)	2217	(8$^-$)		
381	3826	15$^{(-)}$	3445	13$^{(-)}$		
384	2847	(10$^-$)	2464	(8$^-$)		
398	1975	(7$^-$)	1577	(5$^-$)		
398	2266		1868	5$^+$		
402	807	4$^+$	405	2$^+$	Q	Iγ=84, A_2=+0.18 (1973Pr16). 402.6 keV (1973Pr16).
405	405	2$^+$	0.0	0$^+$	Q	Iγ=100, A_2=+0.17 (1973Pr16).
416	2810	(11$^-$)	2394	(9$^-$)		
420	2847	(10$^-$)	2427	(9$^-$)		
420	3267	(12$^-$)	2847	(10$^-$)		
424	1589	8$^+$	1165	6$^+$	Q	Iγ=63, A_2=+0.23 (1973Pr16). 424.2 keV (1973Pr16).
441	4267	17$^{(-)}$	3826	15$^{(-)}$		
443	3015		2572			
452	2427	(9$^-$)	1975	(7$^-$)		
452	3088	11$^{(-)}$	2635	(10$^+$)		
457	3049	(12$^-$)	2592	(10$^-$)		
460	1080	4$^+$	620	2$^+$		
468	3735	(14$^-$)	3267	(12$^-$)		
469[‡]	3088	11$^{(-)}$	2617	12$^+$		
478	2154	(8$^+$)	1676	(6$^+$)		

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^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16 (continued)

$\gamma(^{186}Hg)$ (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
481	2635	(10^+)	2154	(8^+)		
481	3314		2833	10^+		
486	3501		3015			
488	2464	(8^-)	1975	(7^-)		
489	2077	10^+	1589	8^+	Q	Iγ=41, A_2=+0.26 (1973Pr16). 488.9 keV (1973Pr16).
494	3303	(13^-)	2810	(11^-)		
498	1577	(5^-)	1080	4^+		
500	2927	(11^-)	2427	(9^-)		
507	4774	$19^{(-)}$	4267	$17^{(-)}$		
530	4265	(16^-)	3735	(14^-)		
532	3582	(14^-)	3049	(12^-)		
538	4039		3501			
538	5404		4866			
541	2617	12^+	2077	10^+	Q	Iγ=27, A_2=+0.17 (1973Pr16). 542.0 keV (1973Pr16).
543	3470	(13^-)	2927	(11^-)		
558	2635	(10^+)	2077	10^+		
567	5341	$21^{(-)}$	4774	$19^{(-)}$		
569	3872	(15^-)	3303	(13^-)		
573	4838	(18^-)	4265	(16^-)		
581	3198	14^+	2617	12^+	Q	Iγ=16, A_2=+0.38 (1973Pr16). 581.6 keV (1973Pr16).
582	4052	(15^-)	3470	(13^-)		
591	4643	(17^-)	4052	(15^-)		
591	5429	(20^-)	4838	(18^-)		
597	1676	(6^+)	1080	4^+		
600	4182	(16^-)	3582	(14^-)		
601	4866		4265	(16^-)		
602	4640		4039			
607	1228	3^-	620	2^+		
607	2184	(6^-)	1577	(5^-)		
609	6038	(22^-)	5429	(20^-)		
610	3808	16^+	3198	14^+		
621	5962	$23^{(-)}$	5341	$21^{(-)}$		
624	5267	(19^-)	4643	(17^-)		
628	4500	(17^-)	3872	(15^-)		
636	4444	18^+	3808	16^+		
642	6680	(24^-)	6038	(22^-)		
655	3969		3314			
655	4624		3969			
665	5109	20^+	4444	18^+		
671	6633	(25^-)	5962	$23^{(-)}$		
674[‡]	4856?		4182	(16^-)		Eγ: Not adopted, questionable placement.
675	1080	4^+	405	2^+		
693	5317		4624			
698	3314		2617	12^+		
699	5808	22^+	5109	20^+		
703	1868	5^+	1165	6^+		
718[‡]	5218?		4500	(17^-)		Eγ: Not adopted, questionable placement.
721	7354	(27^-)	6633	(25^-)		
739	6547	(24^+)	5808	22^+		
755	2833	10^+	2077	10^+		
770	1577	(5^-)	807	4^+		
788	1868	5^+	1080	4^+		
811	1975	(7^-)	1165	6^+		
826	1906	(6^+)	1080	4^+		
838	2427	(9^-)	1589	8^+		

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^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16 (continued)

$\gamma(^{186}Hg)$ (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π
869	1676	(6^+)	807	4^+
1011	3088	$11^{(-)}$	2077	10^+
1098	1906	(6^+)	807	4^+
1101	2266		1165	6^+
1243	2833	10^+	1589	8^+

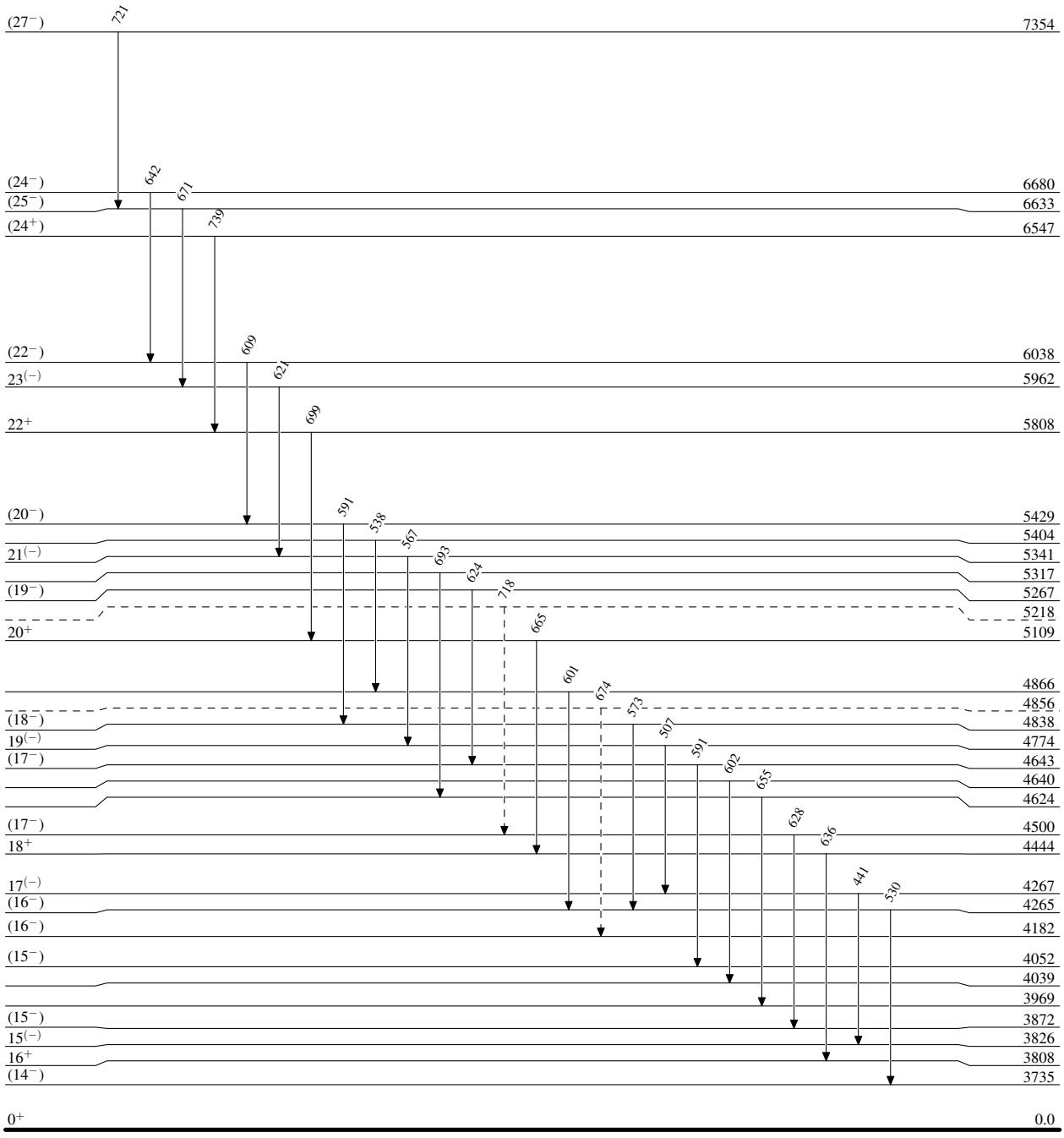
† From A_2 of $\gamma(\theta)$ (1973Pr16).
‡ Placement of transition in the level scheme is uncertain.

Legend

^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16

Level Scheme

γ Decay (Uncertain)



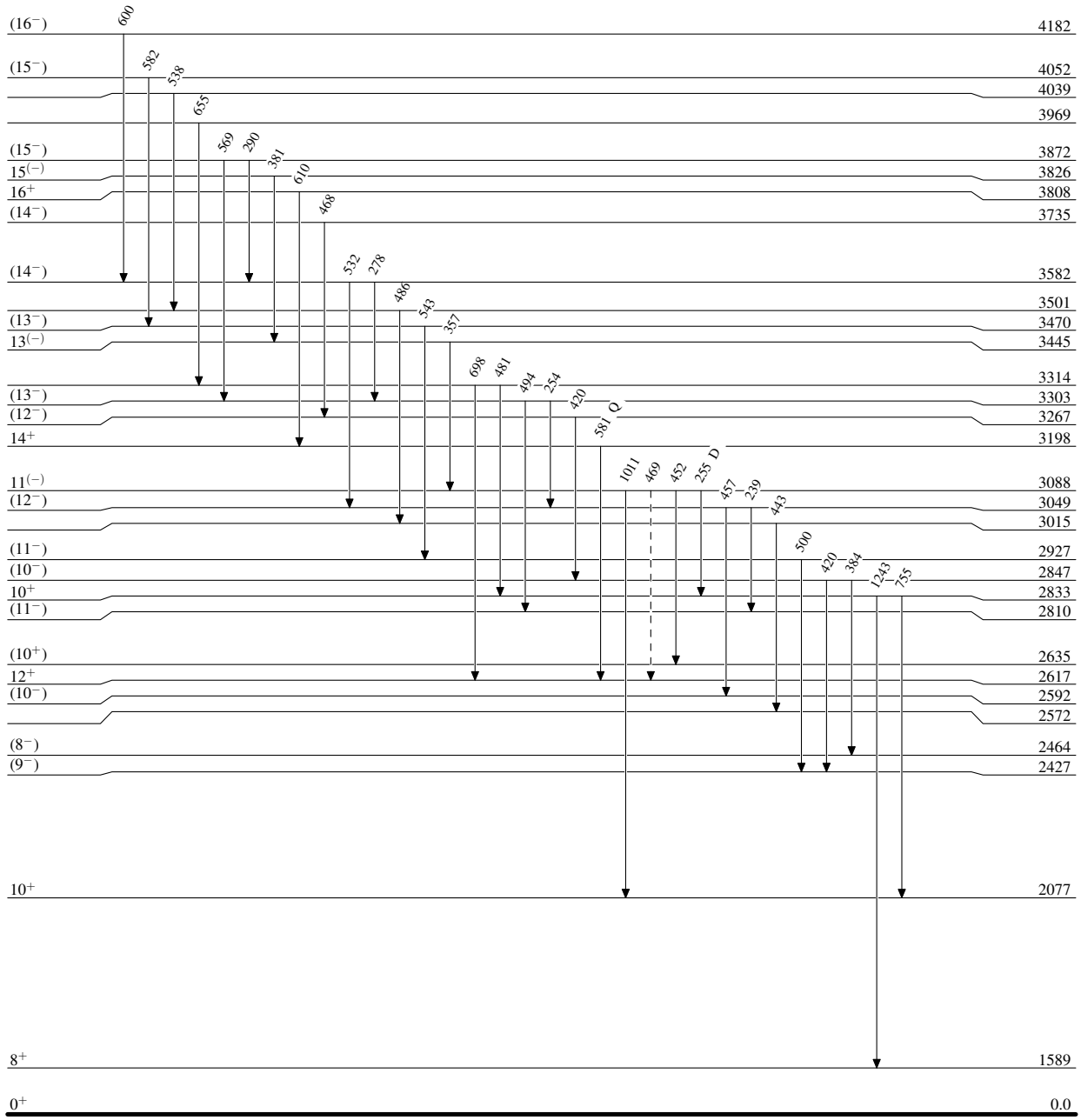
$^{186}_{80}Hg_{106}$

Legend

^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16

Level Scheme (continued)

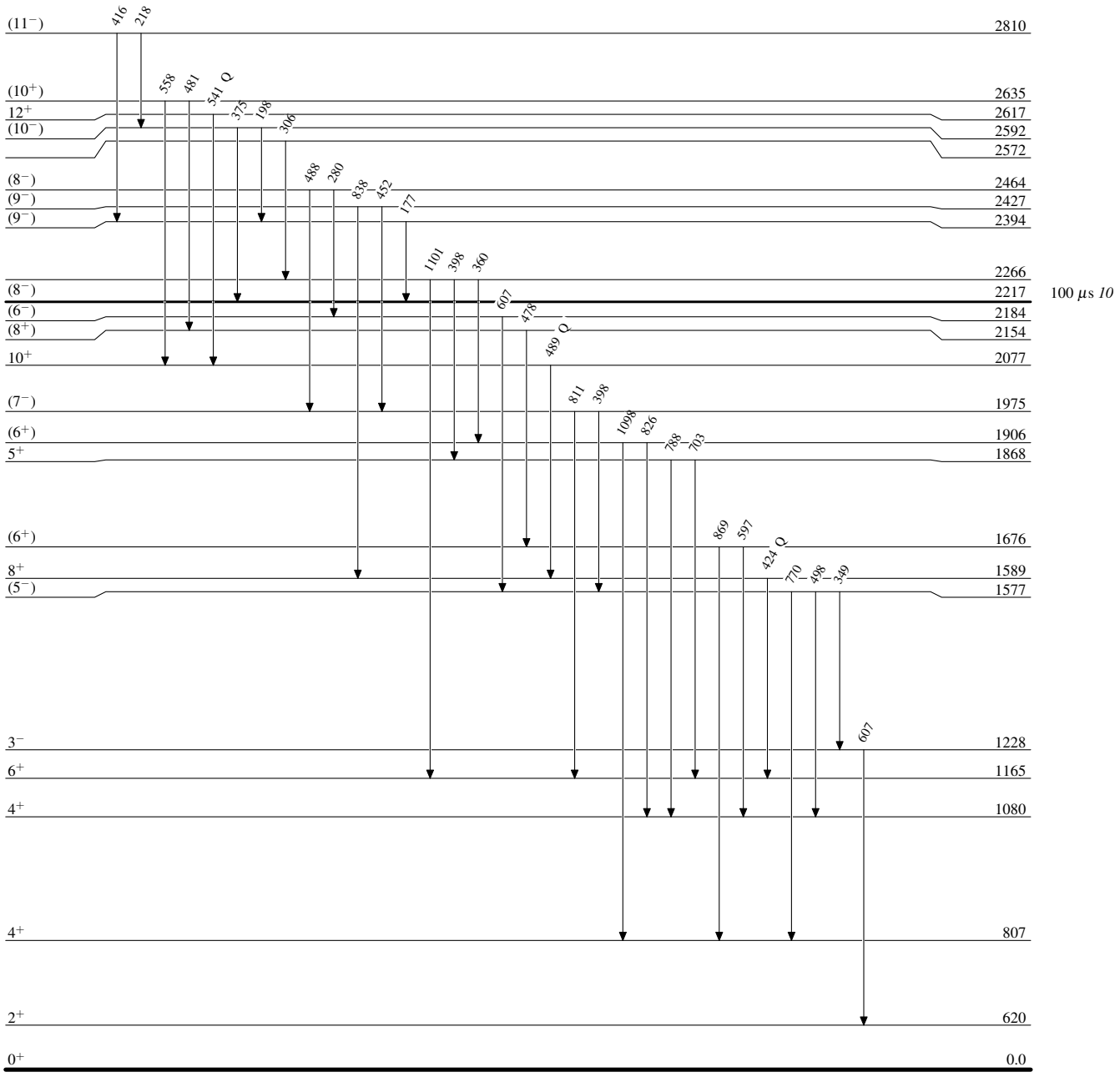
- - - - - - ► γ Decay (Uncertain)



$^{186}_{80}Hg_{106}$

^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16

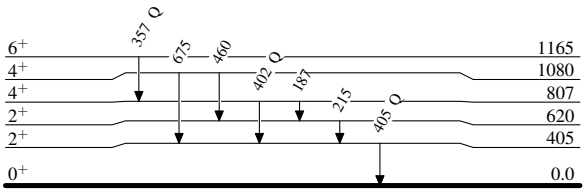
Level Scheme (continued)



$^{186}_{80}Hg_{106}$

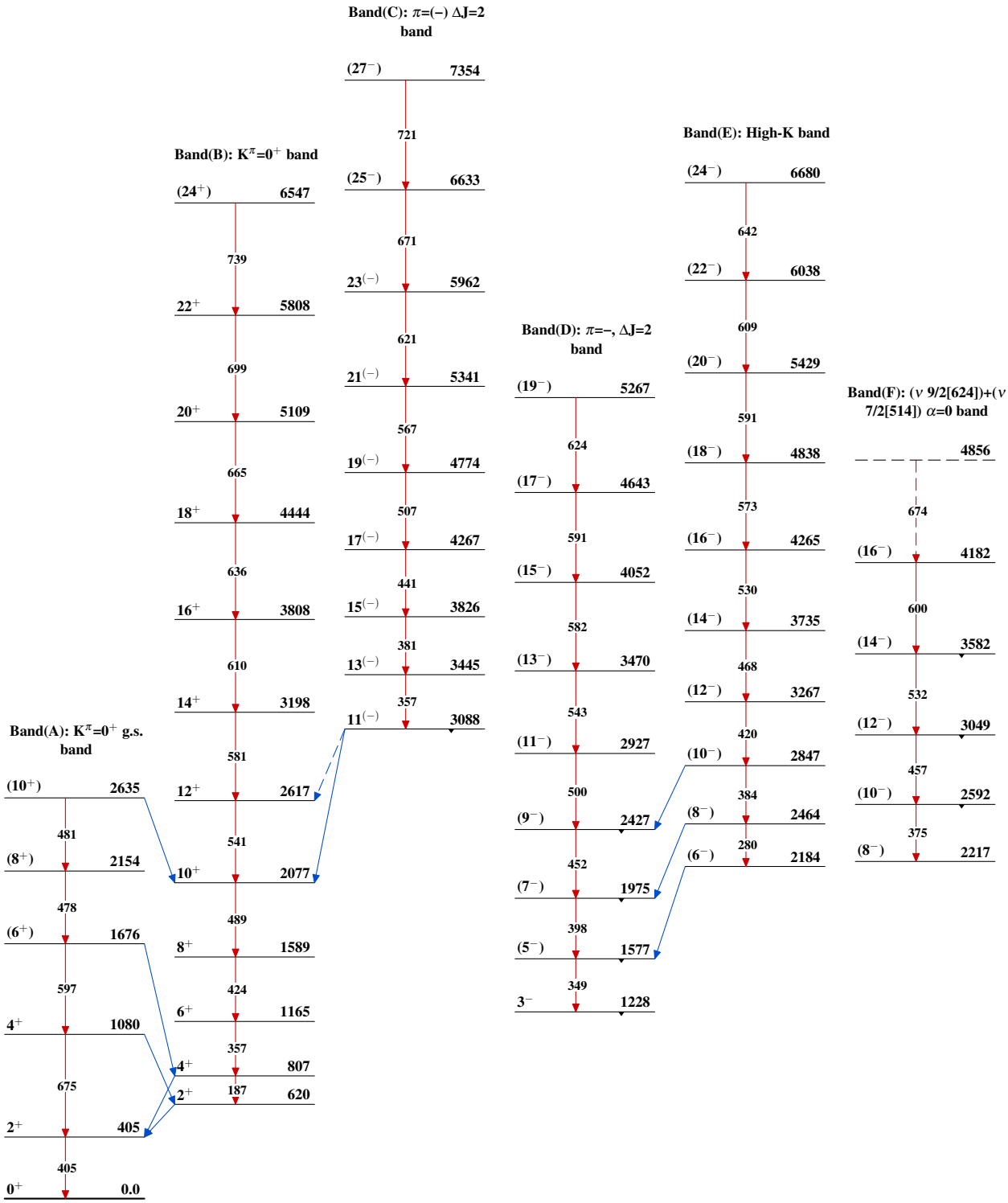
^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16

Level Scheme (continued)



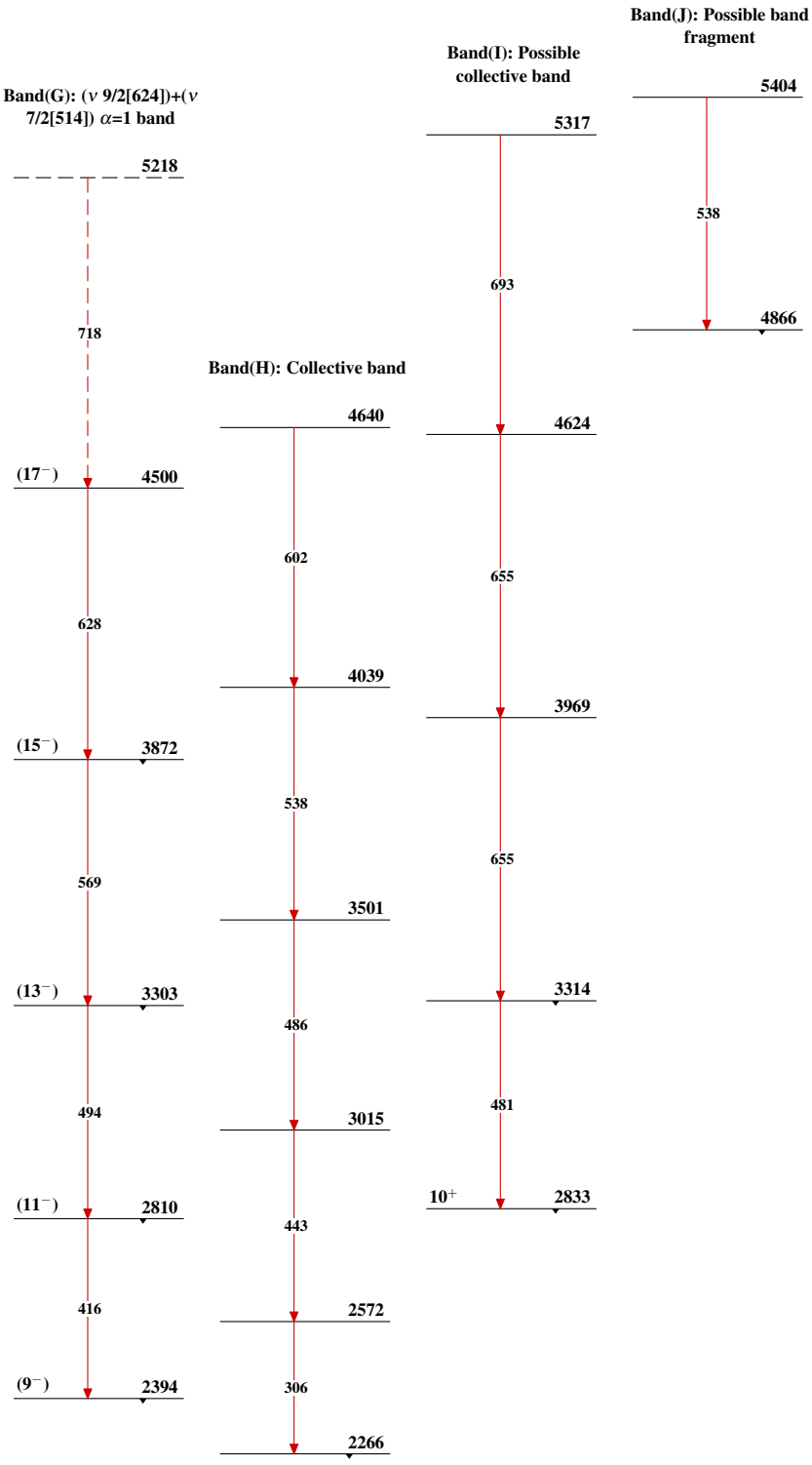
$^{186}_{80}Hg_{106}$

^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16



$^{186}_{80}Hg_{106}$

^{162}Dy(^{28}Si,4nγ) 1992Po01,1973Pr16 (continued)



$^{186}_{80}Hg_{106}$