

$^{124}\text{Sn}(^{36}\text{S},\alpha 4n\gamma)$ **2007Ca25**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 114, 1497 (2013)	31-Aug-2013

E=175 MeV. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ coin, $\gamma\gamma(\theta)$ (DCO).

^{152}Gd Levels

configuration: See authors' paper for a discussion of the configurations.

E(level) [#]	J ^{π} &	E(level) [#]	J ^{π} &	E(level) [#]	J ^{π} &	E(level) [#]	J ^{π} &
0 ^a	0 ⁺	3497 ^a	14 ⁺	6095 ^g	22 ⁺	9106 ^e	(28) ⁻
344 ^a	2 ⁺	3507 ^e	12 ⁻	6258 ^f	21 ⁻	9435 ^g	30 ⁺
755 ^a	4 ⁺	3698 ^g	14 ⁺	6297 ^a	22 ⁺	9541 ^d	30 ⁻
930 ^b	2 ⁺	3728 ^f	13 ⁻	6596 ^d	22 ⁻	9955 ^h	31 ⁻
1118 ^c	3 ⁻	3896 ^d	14 ⁻	6625 ^h	23 ⁻	10224 ^g	32 ⁺
1226 ^a	6 ⁺	3936 ^c	15 ⁻	6636 ^e	22 ⁻	10353 [?]	(32) ⁺
1282 ^b	4 ⁺	3975 ^e	14 ⁻	6833 ^c	23 ⁻	10449 ^d	32 ⁻
1465 ^c	5 ⁻	4140 ^a	16 ⁺	6875 ^g	24 ⁺	10916 ^h	33 ⁻
1667 ^b	6 ⁺	4193 ^g	16 ⁺	7024 ^f	23 ⁻	11063 ^g	34 ⁺
1745 ^a	8 ⁺	4246 ^f	15 ⁻	7086 ^a	24 ⁺	11519 ^{‡d}	34 ⁻
1878 ^c	7 ⁻	4524 ^d	16 ⁻	7263 ^h	25 ⁻	11887 ^{@h}	35 ⁻
2137 ^b	8 ⁺	4539 ^e	16 ⁻	7277 ^d	24 ⁻	11929	35 ⁻
2298 ^a	10 ⁺	4607 ^c	17 ⁻	7420 ^e	24 ⁻	11951 ^g	36 ⁺
2329 ^c	9 ⁻	4745 ^g	18 ⁺	7531 ^c	25 ⁻	12265 ^d	36 ⁻
2535 ^d	8 ⁻	4832 ^a	18 ⁺	7720 ^g	26 ⁺	12710 ^h	37 ⁻
2690 ^b	10 ⁺	4851 ^f	17 ⁻	7830 ^f	25 ⁻	13064 ^g	38 ⁺
2812 ^c	11 ⁻	5183 ^e	18 ⁻	7856 ^a	26 ⁺	13085 ^d	38 ⁻
2872 ^e	8 ⁻	5211 ^d	18 ⁻	7987 ^d	26 ⁻	13545 ^h	39 ⁻
2882 ^a	12 ⁺	5332 ^c	19 ⁻	8127 ^h	27 ⁻	13941 ^d	40 ⁻
2888 ^d	10 ⁻	5384 ^g	20 ⁺	8246 ^e	(26) ⁻	14119 ^{‡g}	40 ⁺
3009 ^f	9 ⁻	5529 ^f	19 ⁻	8290 ^c	27 ⁻	14398 ^h	41 ⁻
3156 ^e	10 ⁻	5545 ^a	20 ⁺	8619 ^g	28 ⁺	15124 ^{‡g}	42 ⁺
3247 ^g	12 ⁺	5851 ^h	21 ⁻	8637	28 ⁺	15484 ^h	43 ⁻
3316 ^f	11 ⁻	5888 ^e	20 ⁻	8677 ^{?f}	(27) ⁻	16183 ^g	44 ⁺
3336 ^c	13 ⁻	5921 ^d	20 ⁻	8723 ^d	28 ⁻	17360 ^g	46 ⁺
3344 ^d	12 ⁻	6079 ^c	21 ⁻	9025 ^h	29 ⁻	18721 ^g	48 ⁺

[†] Energies of the 40⁺ and 42⁺ levels are uncertain since the ordering of the 1059-1005-1055 γ cascade is not established.

[‡] Energy is uncertain since the ordering of the 746-1070 γ cascade is not established.

[#] From least-squares fit to $E\gamma$'s with the assumption that the uncertainty is the same for each of the gammas.

[@] Possible band crossing at 35⁻ level.

[&] From the authors based on band assignments.

^a Band(A): $K^\pi=0^+$ band.

^b Band(B): $K^\pi=2^+$ band.

^c Band(C): $K^\pi=3^-$ band.

^d Band(D): Negative-parity odd-spin band.

^e Band(E): Negative-parity even-spin band.

^f Band(F): Negative-parity odd-spin band.

$^{124}\text{Sn}(^{36}\text{S},\alpha 4n\gamma)$ **2007Ca25 (continued)** ^{152}Gd Levels (continued)^g Band(G): Negative-parity even-spin band.^h Band(H): Negative-parity odd-spin band. $\gamma(^{152}\text{Gd})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
137 [#]	3009	9 ⁻	2872?	8 ⁻	552	4745	18 ⁺	4193	16 ⁺
147 [#]	3156	10 ⁻	3009	9 ⁻	552	5384	20 ⁺	4832	18 ⁺
160	3316	11 ⁻	3156	10 ⁻	553	2298	10 ⁺	1745	8 ⁺
191	3507	12 ⁻	3316	11 ⁻	553	2690	10 ⁺	2137	8 ⁺
220	3728	13 ⁻	3507	12 ⁻	557	3247	12 ⁺	2690	10 ⁺
247	3975	14 ⁻	3728	13 ⁻	564	4539	16 ⁻	3975	14 ⁻
271	4246	15 ⁻	3975	14 ⁻	584	2329	9 ⁻	1745	8 ⁺
283 [#]	3156	10 ⁻	2872?	8 ⁻	584	2882	12 ⁺	2298	10 ⁺
293	4539	16 ⁻	4246	15 ⁻	586	930	2 ⁺	344	2 ⁺
307	3316	11 ⁻	3009	9 ⁻	590	2888	10 ⁻	2298	10 ⁺
312	4851	17 ⁻	4539	16 ⁻	600	3936	15 ⁻	3336	13 ⁻
332	5183	18 ⁻	4851	17 ⁻	605	4745	18 ⁺	4140	16 ⁺
344	344	2 ⁺	0	0 ⁺	605	4851	17 ⁻	4246	15 ⁻
346	5529	19 ⁻	5183	18 ⁻	615	3497	14 ⁺	2882	12 ⁺
347 [#]	1465	5 ⁻	1118	3 ⁻	628	4524	16 ⁻	3896	14 ⁻
351	3507	12 ⁻	3156	10 ⁻	638	7263	25 ⁻	6625	23 ⁻
352	1282	4 ⁺	930	2 ⁺	639	5384	20 ⁺	4745	18 ⁺
353	2888	10 ⁻	2535	8 ⁻	643	4140	16 ⁺	3497	14 ⁺
359	5888	20 ⁻	5529	19 ⁻	644	5183	18 ⁻	4539	16 ⁻
370	6258	21 ⁻	5888	20 ⁻	652	1878	7 ⁻	1226	6 ⁺
378	6636	22 ⁻	6258	21 ⁻	671	4607	17 ⁻	3936	15 ⁻
385	1667	6 ⁺	1282	4 ⁺	675	6596	22 ⁻	5921	20 ⁻
388	7024	23 ⁻	6636	22 ⁻	678	5529	19 ⁻	4851	17 ⁻
392	2137	8 ⁺	1745	8 ⁺	681	7277	24 ⁻	6596	22 ⁻
411	755	4 ⁺	344	2 ⁺	687	5211	18 ⁻	4524	16 ⁻
412	3728	13 ⁻	3316	11 ⁻	693	4832	18 ⁺	4140	16 ⁺
413 [#]	1878	7 ⁻	1465	5 ⁻	696	4193	16 ⁺	3497	14 ⁺
439	3936	15 ⁻	3497	14 ⁺	698	7531	25 ⁻	6833	23 ⁻
441	1667	6 ⁺	1226	6 ⁺	705	5888	20 ⁻	5183	18 ⁻
450	3698	14 ⁺	3247	12 ⁺	710 [#]	1465	5 ⁻	755	4 ⁺
451	2329	9 ⁻	1878	7 ⁻	710	5921	20 ⁻	5211	18 ⁻
454	3336	13 ⁻	2882	12 ⁺	710	7987	26 ⁻	7277	24 ⁻
456	3344	12 ⁻	2888	10 ⁻	711	6095	22 ⁺	5384	20 ⁺
462	3344	12 ⁻	2882	12 ⁺	713	5545	20 ⁺	4832	18 ⁺
468	3975	14 ⁻	3507	12 ⁻	725	5332	19 ⁻	4607	17 ⁻
470	2137	8 ⁺	1667	6 ⁺	729	6258	21 ⁻	5529	19 ⁻
471	1226	6 ⁺	755	4 ⁺	734 [#]	9025	29 ⁻	8290	27 ⁻
483	2812	11 ⁻	2329	9 ⁻	736	8723	28 ⁻	7987	26 ⁻
495	4193	16 ⁺	3698	14 ⁺	746 [‡]	12265	36 ⁻	11519?	34 ⁻
505	3316	11 ⁻	2812	11 ⁻	747	6079	21 ⁻	5332	19 ⁻
514	2812	11 ⁻	2298	10 ⁺	748	6636	22 ⁻	5888	20 ⁻
519	1745	8 ⁺	1226	6 ⁺	752	6297	22 ⁺	5545	20 ⁺
519	4246	15 ⁻	3728	13 ⁻	754	6833	23 ⁻	6079	21 ⁻
519	5851	21 ⁻	5332	19 ⁻	759	8290	27 ⁻	7531	25 ⁻
524	3336	13 ⁻	2812	11 ⁻	766	7024	23 ⁻	6258	21 ⁻
526	1282	4 ⁺	755	4 ⁺	770	7856	26 ⁺	7086	24 ⁺
546	6625	23 ⁻	6079	21 ⁻	774 [#]	1118	3 ⁻	344	2 ⁺
552	3896	14 ⁻	3344	12 ⁻	774	6625	23 ⁻	5851	21 ⁻

Continued on next page (footnotes at end of table)

$^{124}\text{Sn}(^{36}\text{S},\alpha 4n\gamma)$ **2007Ca25 (continued)** $\gamma(^{152}\text{Gd})$ (continued)

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
780	6875	24 ⁺	6095	22 ⁺	888	11951	36 ⁺	11063	34 ⁺
781 [#]	12710	37 ⁻	11929	35 ⁻	898	9025	29 ⁻	8127	27 ⁻
784	7420	24 ⁻	6636	22 ⁻	899	8619	28 ⁺	7720	26 ⁺
789	7086	24 ⁺	6297	22 ⁺	906 [#]	7531	25 ⁻	6625	23 ⁻
789	10224	32 ⁺	9435	30 ⁺	908	10449	32 ⁻	9541	30 ⁻
790	2535	8 ⁻	1745	8 ⁺	917	8637	28 ⁺	7720	26 ⁺
798	9435	30 ⁺	8637	28 ⁺	918 [#]	10353?	(32) ⁺	9435	30 ⁺
806	7830	25 ⁻	7024	23 ⁻	930	9955	31 ⁻	9025	29 ⁻
816	3698	14 ⁺	2882	12 ⁺	961	10916	33 ⁻	9955	31 ⁻
816.0	9435	30 ⁺	8619	28 ⁺	971	11887	35 ⁻	10916	33 ⁻
818	9541	30 ⁻	8723	28 ⁻	987	3316	11 ⁻	2329	9 ⁻
820	13085	38 ⁻	12265	36 ⁻	994 [#]	2872?	8 ⁻	1878	7 ⁻
823	12710	37 ⁻	11887	35 ⁻	1005 [†]	15124?	42 ⁺	14119?	40 ⁺
826 [#]	8246?	(26) ⁻	7420	24 ⁻	1013	11929	35 ⁻	10916	33 ⁻
827	3156	10 ⁻	2329	9 ⁻	1018	3316	11 ⁻	2298	10 ⁺
835	13545	39 ⁻	12710	37 ⁻	1055 [†]	14119?	40 ⁺	13064	38 ⁺
839	11063	34 ⁺	10224	32 ⁺	1059 [†]	16183	44 ⁺	15124?	42 ⁺
845	7720	26 ⁺	6875	24 ⁺	1070 [‡]	11519?	34 ⁻	10449	32 ⁻
847 [#]	8677?	(27) ⁻	7830	25 ⁻	1086	15484	43 ⁻	14398	41 ⁻
853	14398	41 ⁻	13545	39 ⁻	1113	13064	38 ⁺	11951	36 ⁺
856	13941	40 ⁻	13085	38 ⁻	1177	17360	46 ⁺	16183	44 ⁺
860 [#]	9106?	(28) ⁻	8246?	(26) ⁻	1361	18721	48 ⁺	17360	46 ⁺
864	8127	27 ⁻	7263	25 ⁻					

[†] The ordering of the 1059-1005-1055 cascade is not established.

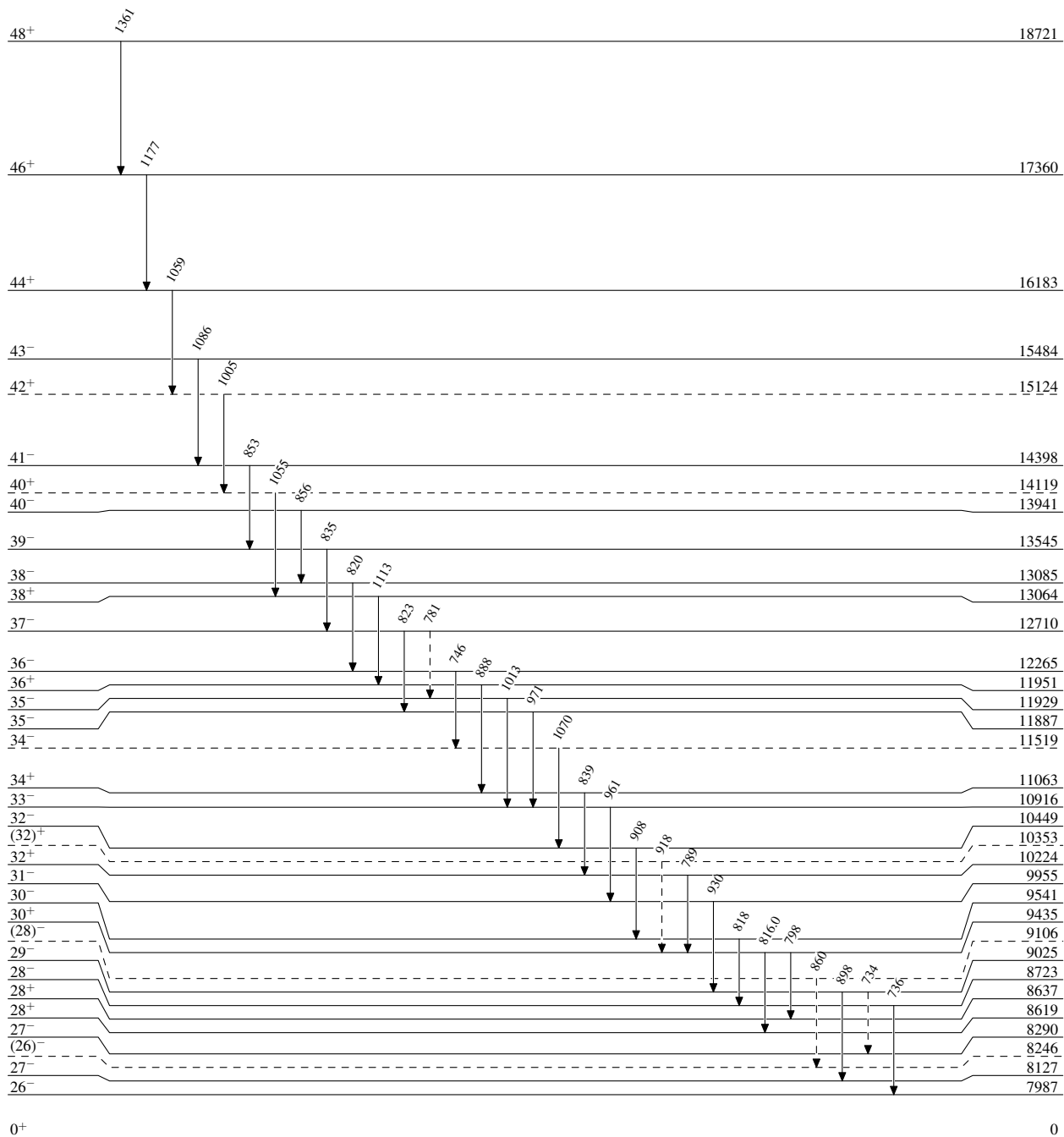
[‡] The ordering of the 746-1070 cascade is not established.

[#] Placement of transition in the level scheme is uncertain.

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Legend

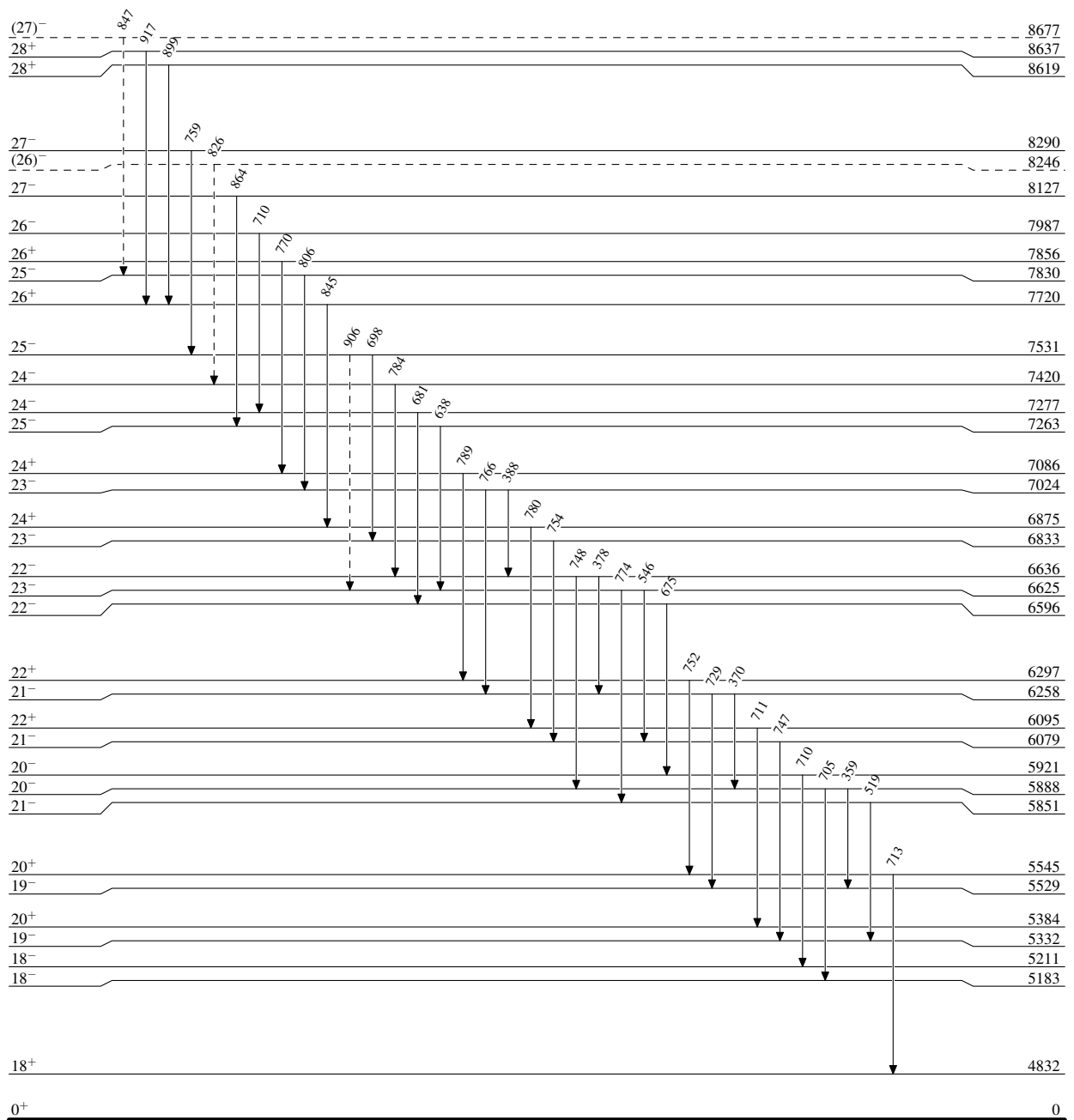
Level Scheme

-----> γ Decay (Uncertain) $^{152}_{64}\text{Gd}_{88}$

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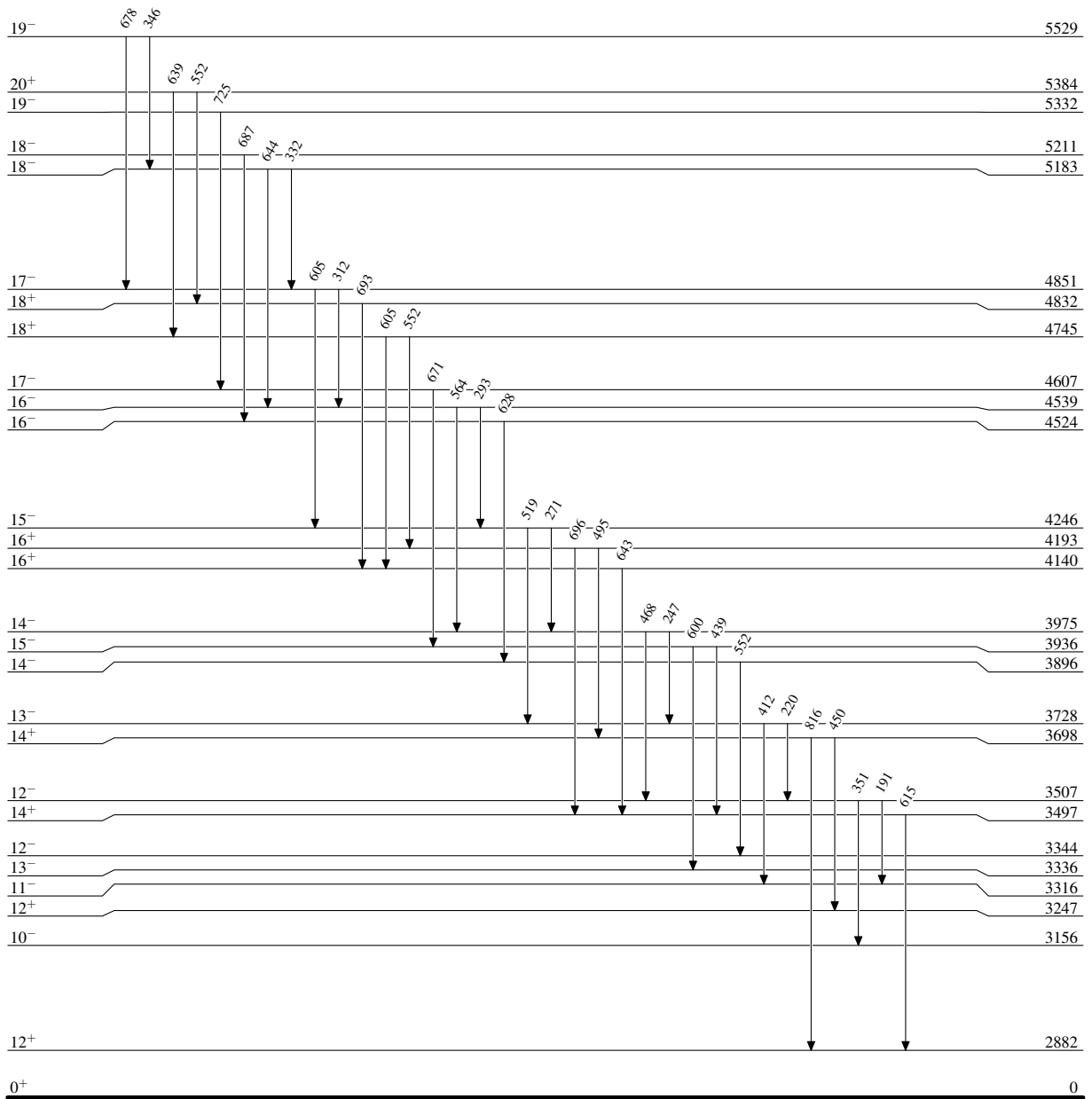
Legend

Level Scheme (continued)

-----> γ Decay (Uncertain) $^{152}_{64}\text{Gd}_{88}$

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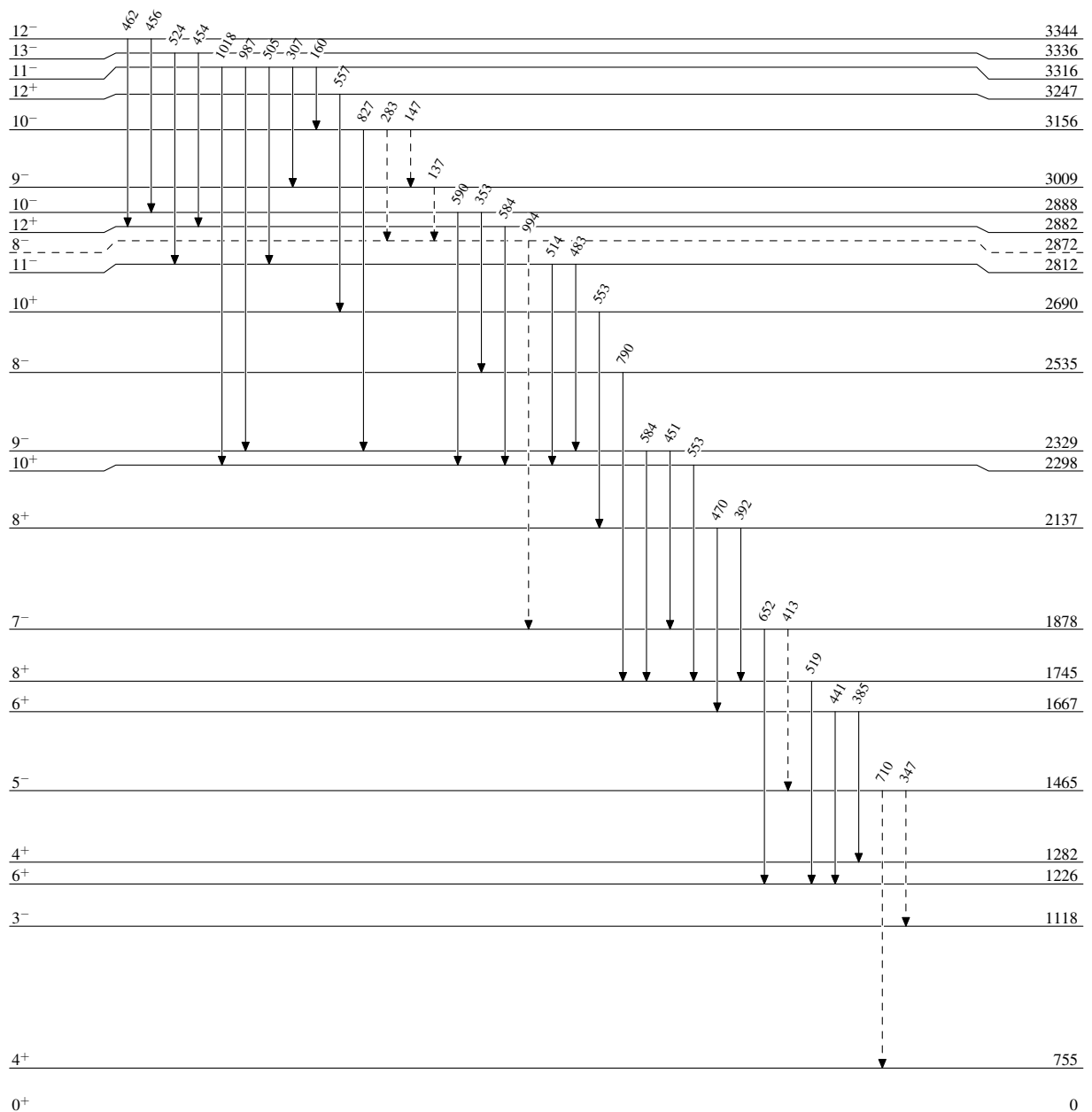
Level Scheme (continued)

 $^{152}_{64}\text{Gd}_{88}$

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Legend

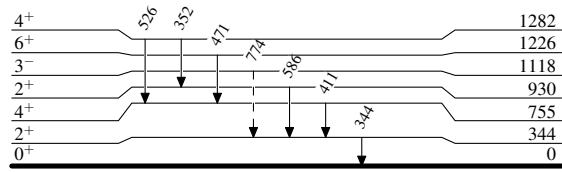
Level Scheme (continued)

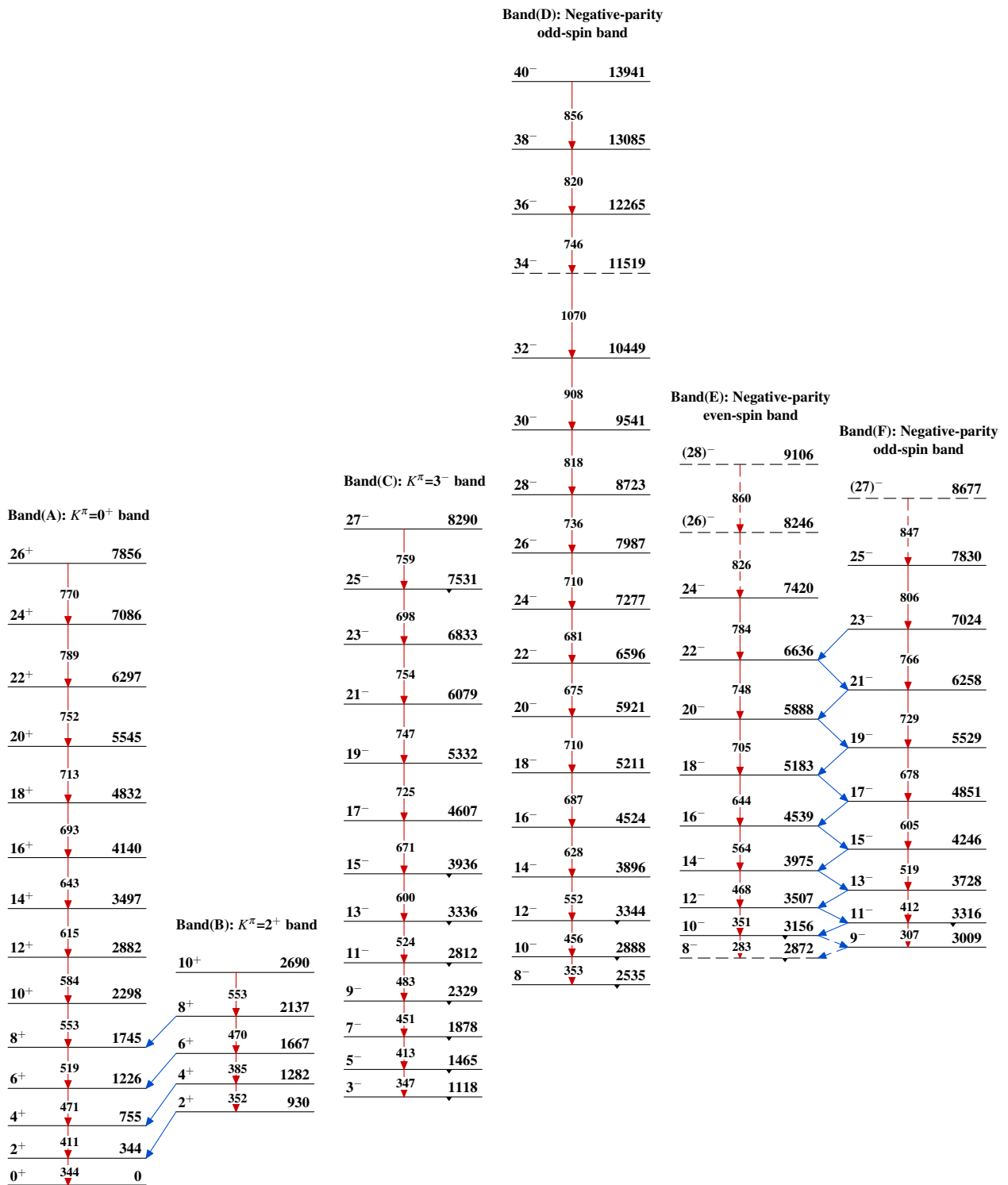
-----► γ Decay (Uncertain) $^{152}_{64}\text{Gd}_{88}$

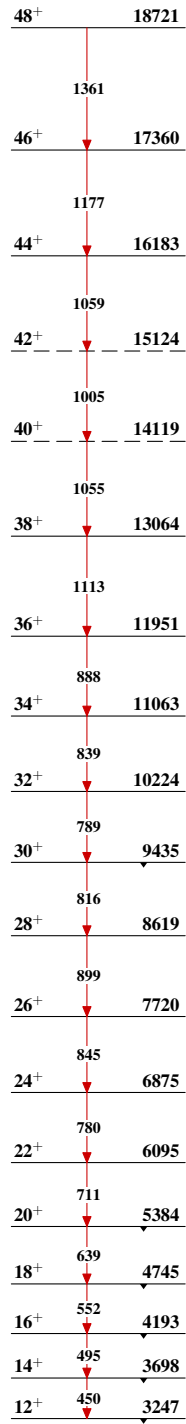
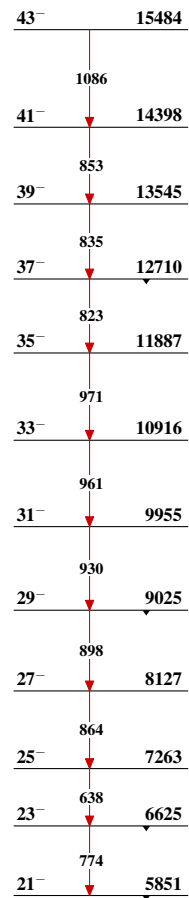
$^{124}\text{Sn}(^{36}\text{S},\alpha 4n\gamma)$ 2007Ca25

Legend

Level Scheme (continued)

-----► γ Decay (Uncertain) $^{152}_{64}\text{Gd}_{88}$

$^{124}\text{Sn}(^{36}\text{S},\alpha 4n\gamma)$ 2007Ca25

$^{124}\text{Sn}(^{36}\text{S},\alpha 4n\gamma)$ 2007Ca25 (continued)Band(G): Negative-parity
even-spin bandBand(H): Negative-parity
odd-spin band $^{152}_{64}\text{Gd}_{88}$