

¹²⁴Sn(¹⁶O,5n γ) 2005JaZZ

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Alexander A. Rodionov And Yuri L. Khazov		NDS 109, 517 (2008)	22-Jan-2008

E=80 MeV. Measured E γ , I γ , $\gamma\gamma$, lifetimes using an array of eight Compton-suppressed 'Clover' Ge detectors and 14 NaI(Tl) detectors as multiplicity filter.

¹³⁵Ce Levels

E(level) [†]	J π^{\ddagger}	T _{1/2} [#]	Comments
0.0	1/2 ⁺		
82.65 [@] 6	3/2 ⁽⁺⁾ [@]		
296.11 [@] 5	(5/2 ⁺) [@]		
445.81 ^{&} 21	11/2 ⁻	20 s 1	%IT=100 T _{1/2} : from 'Adopted Levels'.
1034.8 ^{&} 8	13/2 ⁻		
1144.8 ^{&} 8	15/2 ⁻		
1668.8 ^a 12	15/2 ⁻		
1868.8 ^{&} 10	17/2 ⁻		
2050.8 ^{&} 11	19/2 ⁻		
2124.8 ¹³	19/2 ⁺		
2248.8 ^a 14	19/2 ⁻		
2550.8 ¹⁵	23/2 ⁺		
2681.8 ^a 14	21/2 ⁻		
2887.8 ^{&} 11	21/2 ⁻		
2947.9 ^a 14	23/2 ⁻		
3102.8 ^{&} 12	23/2 ⁻		
3504.9 ¹⁴	25/2 ⁻		
3701.9 ^a 15	27/2 ⁻		
3771.9 ¹⁴	27/2 ⁺		
4031.8 ^b 14	25/2 ⁻		
4064.8 ¹³	25/2 ⁻		
4182.8 ^b 12	27/2 ⁻		
4459.7 ^b 14	29/2 ⁻		
4495.8 ^c 13	27/2 ⁻		
4634.9 ^c 13	29/2 ⁻		
4813.7 ^c 13	31/2 ⁻		
4830.0 ^b 14	31/2 ⁻		
5062.2 ^c 14	33/2 ⁻		
5206.0 ^b 14	33/2 ⁻		
5359.0 ^c 14	35/2 ⁻	0.64 ps 11	
5651.0 ^b 14	35/2 ⁻		
5751.1 ^c 14	37/2 ⁻	0.451 ps 21	
6086.1 ^b 14	37/2 ⁻		
6255.5 ^c 14	39/2 ⁻	0.299 ps +25-24	
6526.3 ^b 14	39/2 ⁻		
6840.3 ^c 15	41/2 ⁻	0.163 ps +8-10	T _{1/2} : effective half-life, not corrected for side feeding.
6993.3 ^b 15	41/2 ⁻		
7470.2 ^c 15	43/2 ⁻		
7493.4 ^b 15	43/2 ⁻		

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$^{124}\text{Sn}(^{16}\text{O},5n\gamma)$ **2005JaZZ** (continued) ^{135}Ce Levels (continued)

<u>E(level)[†]</u>	<u>J^π[‡]</u>
8008.6 ^b 16	45/2 ⁻
8034.3 ^c 16	45/2 ⁻

[†] From least-squares fit to E γ 's, assuming $\Delta(E\gamma)=1$ keV for each γ ray.

[‡] As proposed by [2005JaZZ](#).

From DSA method ([2005JaZZ](#)), unless otherwise stated.

@ From 'Adopted Levels'.

& Band(A): $\nu h_{11/2}$ band.

^a Band(B): γ cascade based on 15/2⁻.

^b Band(C): Dipole band based on 25/2⁻. Possible chiral partner of band based on 27/2⁻. Possible configuration= $\pi h_{11/2}^2 \otimes \nu h_{11/2}^{-1}$ as in ^{135}Nd .

^c Band(D): Dipole band based on 27/2⁻. Possible chiral partner of band based on 25/2⁻. Possible configuration= $\pi h_{11/2}^2 \otimes \nu h_{11/2}^{-1}$ as in ^{135}Nd .

 $\gamma(^{135}\text{Ce})$

[2005JaZZ](#) quote B(M1) and B(E2) values for selected transitions from levels for which lifetimes have been measured. Since no branching ratio data are available in the paper, the evaluators have not listed these values in 'Adopted Levels, gammas'.

<u>Eγ</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Comments</u>
82.64 [†] 7	82.65	3/2 ⁽⁺⁾	0.0	1/2 ⁺	
100 [‡]	5751.1	37/2 ⁻	5651.0	35/2 ⁻	
110 [‡]	1144.8	15/2 ⁻	1034.8	13/2 ⁻	
118	4182.8	27/2 ⁻	4064.8	25/2 ⁻	
139	4634.9	29/2 ⁻	4495.8	27/2 ⁻	
149.7 [†] 2	445.81	11/2 ⁻	296.11	(5/2 ⁺)	
151	4182.8	27/2 ⁻	4031.8	25/2 ⁻	
153 [‡]	5359.0	35/2 ⁻	5206.0	33/2 ⁻	
170 [‡]	6255.5	39/2 ⁻	6086.1	37/2 ⁻	
179	4813.7	31/2 ⁻	4634.9	29/2 ⁻	
182 [‡]	2050.8	19/2 ⁻	1868.8	17/2 ⁻	
195 [‡]	4830.0	31/2 ⁻	4634.9	29/2 ⁻	
213.45 [†] 6	296.11	(5/2 ⁺)	82.65	3/2 ⁽⁺⁾	
215 [‡]	3102.8	23/2 ⁻	2887.8	21/2 ⁻	
232 [‡]	5062.2	33/2 ⁻	4830.0	31/2 ⁻	
249.3	5062.2	33/2 ⁻	4813.7	31/2 ⁻	
256	2124.8	19/2 ⁺	1868.8	17/2 ⁻	
266	2947.9	23/2 ⁻	2681.8	21/2 ⁻	
277	4459.7	29/2 ⁻	4182.8	27/2 ⁻	
296.12 [†] 5	296.11	(5/2 ⁺)	0.0	1/2 ⁺	
297.3	5359.0	35/2 ⁻	5062.2	33/2 ⁻	B(M1)=2.0 8.
313 [‡]	4495.8	27/2 ⁻	4182.8	27/2 ⁻	
314	6840.3	41/2 ⁻	6526.3	39/2 ⁻	
318	4813.7	31/2 ⁻	4495.8	27/2 ⁻	
354	4813.7	31/2 ⁻	4459.7	29/2 ⁻	

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$^{124}\text{Sn}(^{16}\text{O},5n\gamma)$ 2005JaZZ (continued) $\gamma(^{135}\text{Ce})$ (continued)

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
370	4830.0	31/2 ⁻	4459.7	29/2 ⁻	
376	5206.0	33/2 ⁻	4830.0	31/2 ⁻	
392 ^{‡#}	5206.0	33/2 ⁻	4813.7	31/2 ⁻	
392.2	5751.1	37/2 ⁻	5359.0	35/2 ⁻	B(M1)=0.80 29.
426	2550.8	23/2 ⁺	2124.8	19/2 ⁺	
427	5062.2	33/2 ⁻	4634.9	29/2 ⁻	
433	2681.8	21/2 ⁻	2248.8	19/2 ⁻	
435	6086.1	37/2 ⁻	5651.0	35/2 ⁻	
440	6526.3	39/2 ⁻	6086.1	37/2 ⁻	
445	5651.0	35/2 ⁻	5206.0	33/2 ⁻	
452	4634.9	29/2 ⁻	4182.8	27/2 ⁻	
467	6993.3	41/2 ⁻	6526.3	39/2 ⁻	
477 [‡]	7470.2	43/2 ⁻	6993.3	41/2 ⁻	
499	7493.4	43/2 ⁻	6993.3	41/2 ⁻	
504.6	6255.5	39/2 ⁻	5751.1	37/2 ⁻	B(M1)=0.76 24.
516	8008.6	45/2 ⁻	7493.4	43/2 ⁻	
529	5359.0	35/2 ⁻	4830.0	31/2 ⁻	
538	8008.6	45/2 ⁻	7470.2	43/2 ⁻	
542 ^{‡#}	8034.3	45/2 ⁻	7493.4	43/2 ⁻	
545	5359.0	35/2 ⁻	4813.7	31/2 ⁻	B(E2)=0.08 3.
545	5751.1	37/2 ⁻	5206.0	33/2 ⁻	
557	3504.9	25/2 ⁻	2947.9	23/2 ⁻	
564 [#]	8034.3	45/2 ⁻	7470.2	43/2 ⁻	
571 ^{‡#}	5206.0	33/2 ⁻	4634.9	29/2 ⁻	
580	2248.8	19/2 ⁻	1668.8	15/2 ⁻	
583.6	6840.3	41/2 ⁻	6255.5	39/2 ⁻	B(M1)=0.54 15.
589	1034.8	13/2 ⁻	445.81	11/2 ⁻	
589 ^{‡#}	5651.0	35/2 ⁻	5062.2	33/2 ⁻	
603	5062.2	33/2 ⁻	4459.7	29/2 ⁻	
605	6255.5	39/2 ⁻	5651.0	35/2 ⁻	
630	7470.2	43/2 ⁻	6840.3	41/2 ⁻	
631 [‡]	4813.7	31/2 ⁻	4182.8	27/2 ⁻	
634	1668.8	15/2 ⁻	1034.8	13/2 ⁻	
652	7493.4	43/2 ⁻	6840.3	41/2 ⁻	
689	5751.1	37/2 ⁻	5062.2	33/2 ⁻	B(E2)=0.14 5.
699	1144.8	15/2 ⁻	445.81	11/2 ⁻	
724	1868.8	17/2 ⁻	1144.8	15/2 ⁻	
727	6086.1	37/2 ⁻	5359.0	35/2 ⁻	
737	6993.3	41/2 ⁻	6255.5	39/2 ⁻	
746	5206.0	33/2 ⁻	4459.7	29/2 ⁻	
754	3701.9	27/2 ⁻	2947.9	23/2 ⁻	
754	6840.3	41/2 ⁻	6086.1	37/2 ⁻	
775	6526.3	39/2 ⁻	5751.1	37/2 ⁻	
821	5651.0	35/2 ⁻	4830.0	31/2 ⁻	
823	3504.9	25/2 ⁻	2681.8	21/2 ⁻	
834	1868.8	17/2 ⁻	1034.8	13/2 ⁻	
837	2887.8	21/2 ⁻	2050.8	19/2 ⁻	
837 ^{‡#}	5651.0	35/2 ⁻	4813.7	31/2 ⁻	
863	4634.9	29/2 ⁻	3771.9	27/2 ⁺	
875	6526.3	39/2 ⁻	5651.0	35/2 ⁻	
880	6086.1	37/2 ⁻	5206.0	33/2 ⁻	
897	6255.5	39/2 ⁻	5359.0	35/2 ⁻	B(E2)=0.022 8.
906	2050.8	19/2 ⁻	1144.8	15/2 ⁻	
907	6993.3	41/2 ⁻	6086.1	37/2 ⁻	

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$^{124}\text{Sn}(^{16}\text{O},5n\gamma)$ **2005JaZZ** (continued) $\gamma(^{135}\text{Ce})$ (continued)

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
929	4031.8	25/2 ⁻	3102.8	23/2 ⁻	
933	4634.9	29/2 ⁻	3701.9	27/2 ⁻	
944 ^{‡#}	7470.2	43/2 ⁻	6526.3	39/2 ⁻	
962	4064.8	25/2 ⁻	3102.8	23/2 ⁻	
966	7493.4	43/2 ⁻	6526.3	39/2 ⁻	
991	4495.8	27/2 ⁻	3504.9	25/2 ⁻	
1019	2887.8	21/2 ⁻	1868.8	17/2 ⁻	
1024	6086.1	37/2 ⁻	5062.2	33/2 ⁻	
1041 ^{‡#}	8034.3	45/2 ⁻	6993.3	41/2 ⁻	
1052	3102.8	23/2 ⁻	2050.8	19/2 ⁻	
1080	4182.8	27/2 ⁻	3102.8	23/2 ⁻	
1089	6840.3	41/2 ⁻	5751.1	37/2 ⁻	B(E2)=0.027 10.
1130	4634.9	29/2 ⁻	3504.9	25/2 ⁻	
1167	6526.3	39/2 ⁻	5359.0	35/2 ⁻	
1168	8008.6	45/2 ⁻	6840.3	41/2 ⁻	
1177	4064.8	25/2 ⁻	2887.8	21/2 ⁻	
1194 [#]	8034.3	45/2 ⁻	6840.3	41/2 ⁻	
1214	7470.2	43/2 ⁻	6255.5	39/2 ⁻	
1221	3771.9	27/2 ⁺	2550.8	23/2 ⁺	
1238	7493.4	43/2 ⁻	6255.5	39/2 ⁻	E_γ : from level-energy difference, 2005JaZZ quote 1242.
1242	6993.3	41/2 ⁻	5751.1	37/2 ⁻	

[†] From 'adopted gammas'.

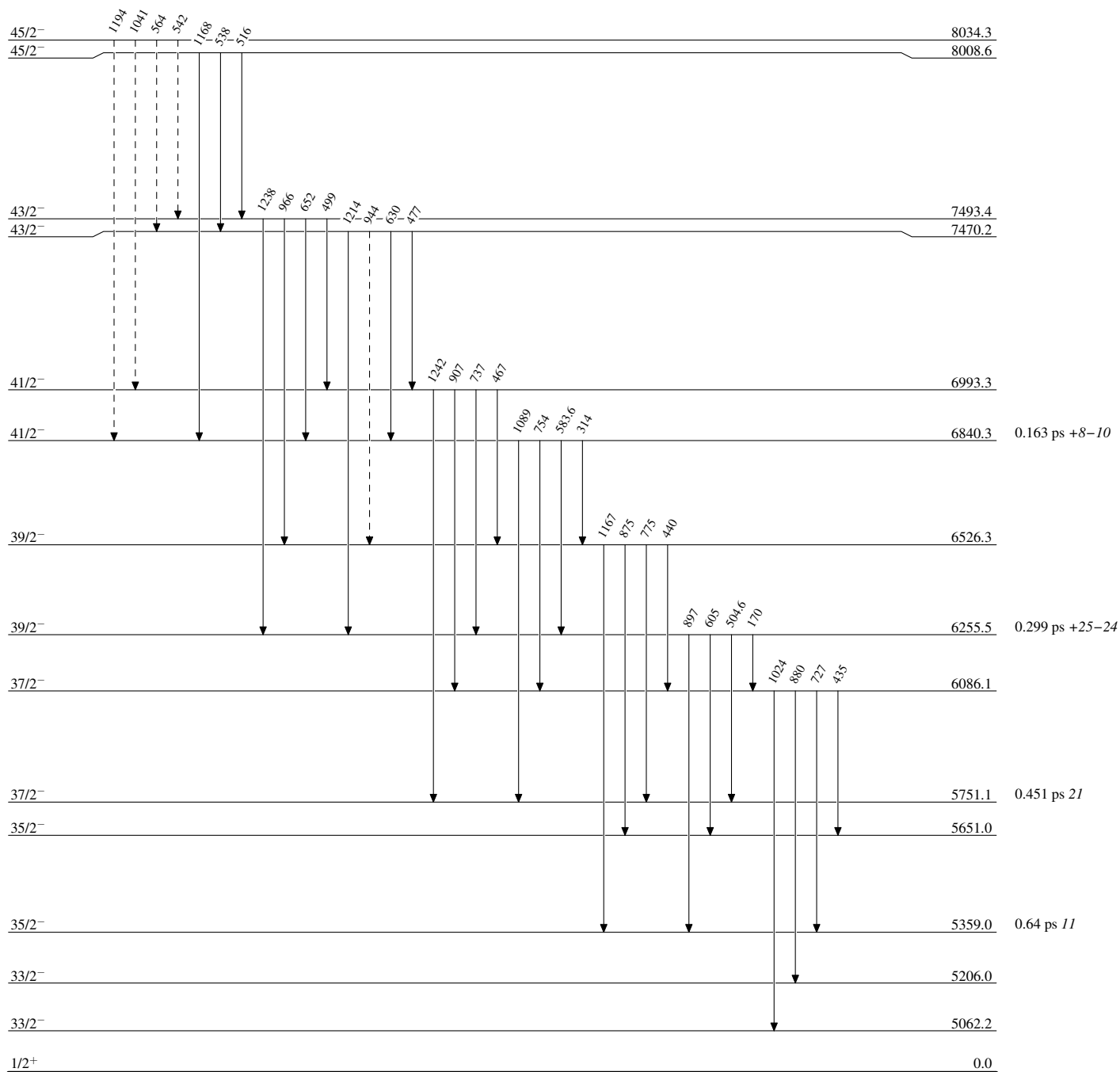
[‡] Value not quoted by **2005JaZZ**, deduced by the evaluators from level-energy difference.

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

$^{124}\text{Sn}(^{16}\text{O},5n\gamma)$ 2005JaZZ

Legend

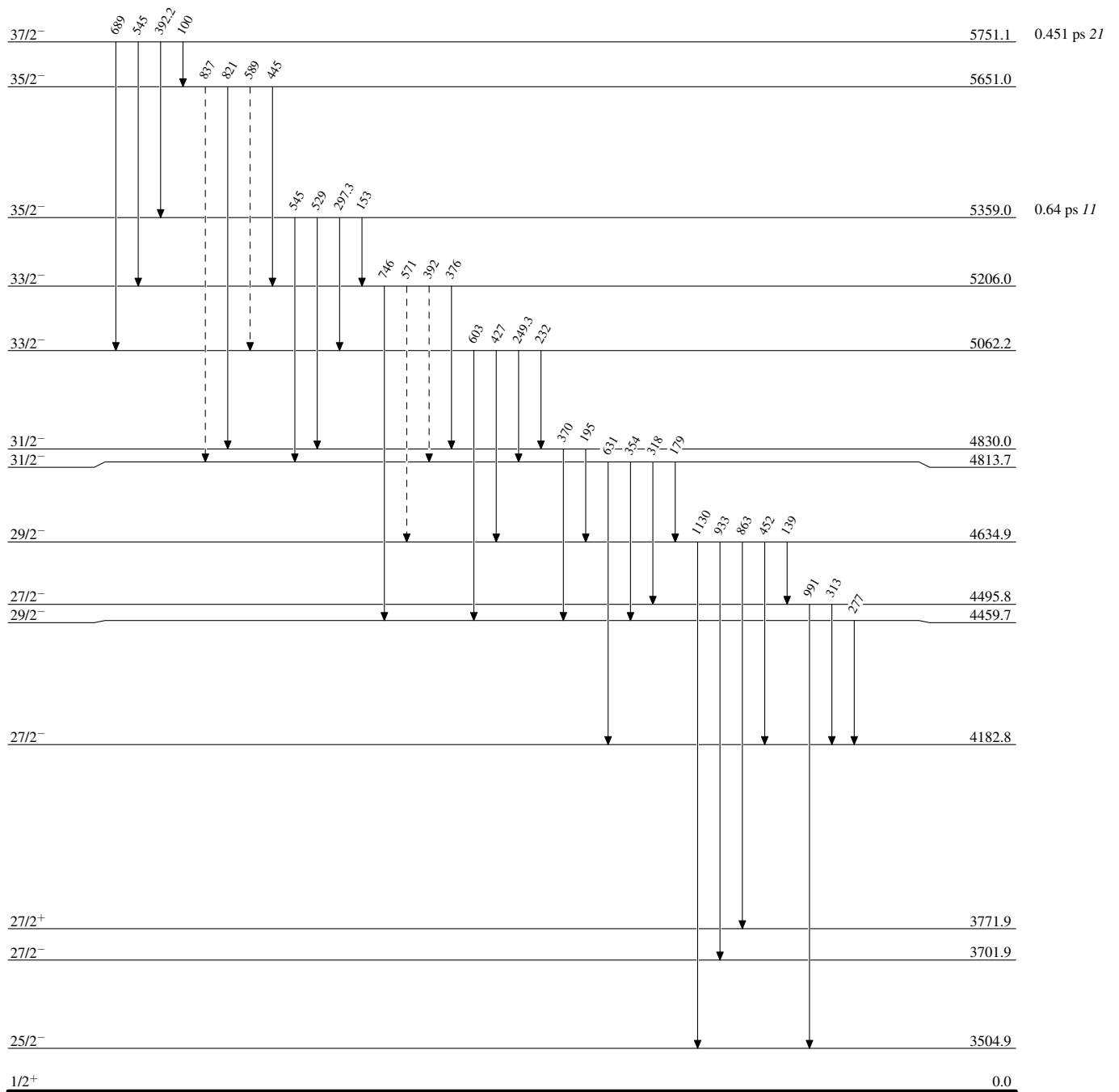
Level Scheme

-----> γ Decay (Uncertain) $^{135}_{58}\text{Ce}_{77}$

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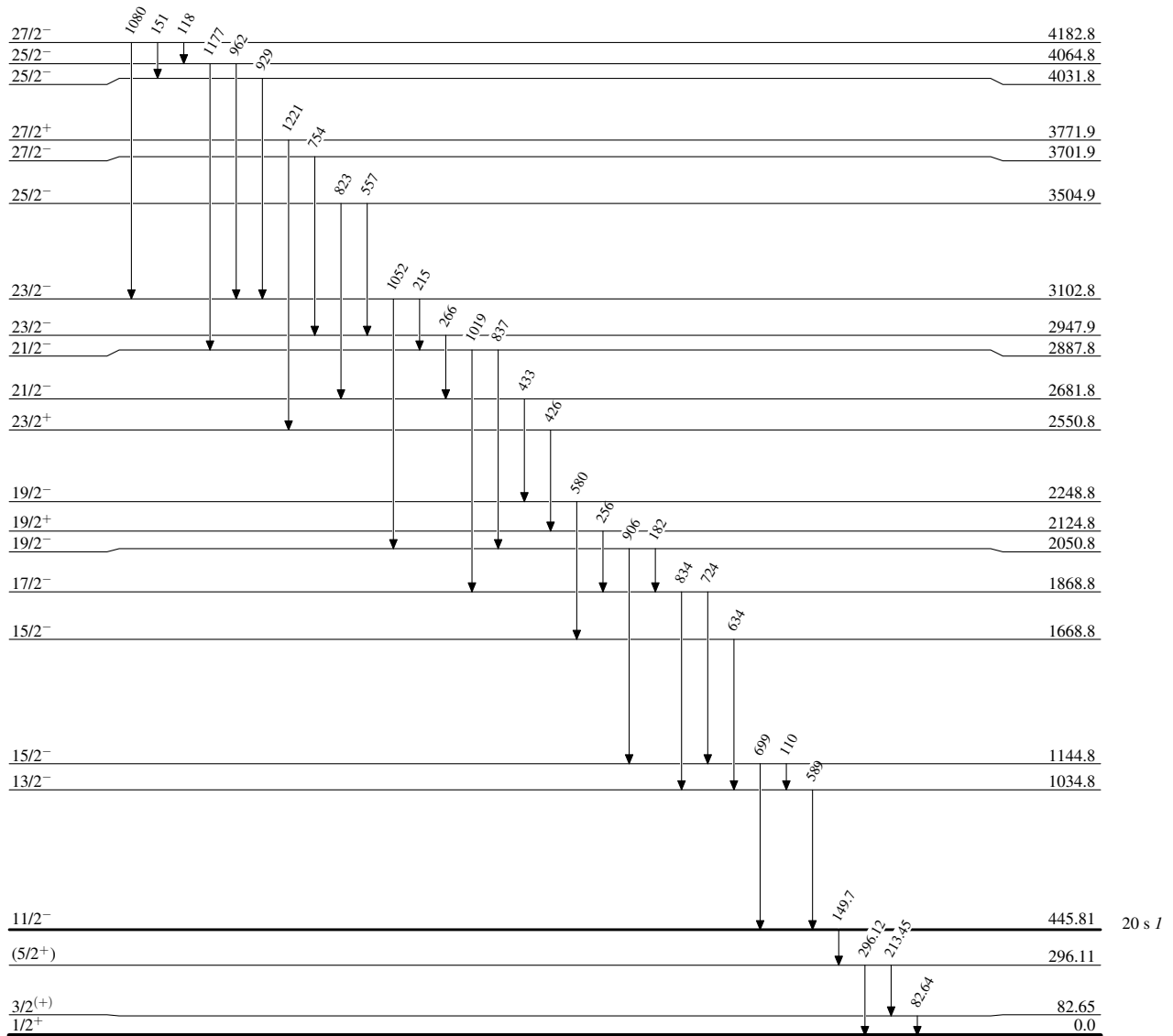
Legend

Level Scheme (continued)

-----> γ Decay (Uncertain) $^{135}_{58}\text{Ce}_{77}$

$^{124}\text{Sn}(^{16}\text{O},5n\gamma)$ 2005JaZZ

Level Scheme (continued)

 $^{135}_{58}\text{Ce}_{77}$

$^{124}\text{Sn}(^{16}\text{O},5n\gamma)$ 2005JaZZ

