^{128}Ce ε decay 2000Li08,1997Ha30

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Zoltan Elekes and Janos Timar	NDS 129, 191 (2015)	28-Feb-2015

Parent: ^{128}Ce: E=0.0; $J^\pi=0^+$; $T_{1/2}$=3.93 min *2*; Q(ε)=3090 *60*; %ε+%$β^+$ decay=100.0

2000Li08: ^{128}Ce from ^{116}Sn(^{16}O,4n), E=90 MeV; chemical separation; γ, γγ coincidence, Xγ coincidence; coaxial and planar HPGe detectors, 99% enriched ^{116}Sn target. ^{117}Sn(^{16}O,3n) was also studied to distinguish ^{128}Ce lines from ^{129}Ce lines.

1997Ha30: ^{103}Rh(^{28}Si,p2n) E=105 MeV; no mass separation; γ, γγ coincidence, γX coincidence.

^{128}La Levels

The decay scheme is that proposed by 2000Li08. Both levels at 607.1 and 840.9 keV in 1997Ha30 are not added by the evaluators. Some levels (91.5, 263.0, 271.8, 422.0, 463.7, 469.8, 487.6, 642.8, 730.0 and 879.5 keV) in 1997Ha30 and their de-exciting γ′s are not adopted, because these are those from the decay of ^{129}La. See 1997Gi08 for the decay of ^{129}La.

E(level)†	J^π#	$T_{1/2}$#	Comments
0.0	(5+)	5.18 min *14*	
0.0+x	(1+,2−)	<1.4 min	Additional information 1.
104.05+x *11*			
146.79+x *10*			
219.21+x *13*			
221.82+x *13*			
256.17+x‡ *25*			
267.45+x‡ *15*			
270.81+x *16*			
282.17+x *16*			
305.99+x *17*			
323.60+x *16*			
338.19+x *15*			
340.46+x‡ *20*			
347.49+x *17*			
401.84+x‡ *20*			
409.95+x‡ *17*			
439.87+x *17*			
502.96+x‡ *23*			
514.25+x‡ *20*			
520.16+x‡ *19*			
523.8+x‡ *4*			
545.28+x *14*			
595.58+x‡ *19*			
620.07+x‡ *23*			
681.12+x‡ *23*			
760.60+x‡ *24*			
762.9+x‡ *4*			
790.45+x‡ *24*			
852.0+x‡ *4*			
916.50+x *15*			
926.42+x *14*			
1056.70+x *14*			
1105.75+x *15*			
1138.94+x‡ *24*			

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^{128}Ce ε decay 2000Li08,1997Ha30 (continued)

^{128}La Levels (continued)

E(level)†
1163.71+x *17*
1336.46+x‡ *17*
1371.97+x *23*

† From a least-squares fit to the Eγ′s.
‡ Not reported in 1997Ha30.
# From Adopted Levels.

γ(^{128}La)

E_γ†	I_γ†&*a*	E_i(level)	E_f	J^π_f	Comments
42.8 *3*	1.8 *2*	146.79+x	104.05+x		
63.0 *3*	2.2 *2*	282.17+x	219.21+x		
72.5 *3*	6.5 *1*	219.21+x	146.79+x		
75.2 *3*	8.9 *1*	221.82+x	146.79+x		
84.3 *3*	0.5 *2*	340.46+x	256.17+x		
86.9 *3*	1.5 *2*	305.99+x	219.21+x		
95.8 *3*	0.7 *1*	401.84+x	305.99+x		
101.9‡ *3*	2.4 *2*	323.60+x	221.82+x		
104.0‡ *3*	59.9 *2*	104.05+x	0.0+x	$(1^+,2^-)$	
109.4 *3*	7.9 *5*	256.17+x	146.79+x		
115.3‡ *3*	7.4 *2*	219.21+x	104.05+x		
118.1‡ *3*	9.0 *1*	221.82+x	104.05+x		
121.1 *3*	4.2 *5*	267.45+x	146.79+x		
142.8 *3*	6.4 *2*	409.95+x	267.45+x		
146.7‡ *3*	100.0	146.79+x	0.0+x	$(1^+,2^-)$	
158.8‡ *3*	1.6 *4*	305.99+x	146.79+x		
163.4 *3*	1.9 *1*	267.45+x	104.05+x		
166.7‡ *3*	8.7 *8*	270.81+x	104.05+x		
176.5‡ *3*	13.3 *2*	323.60+x	146.79+x		
178.0‡ *3*	18.5 *2*	282.17+x	104.05+x		I_γ: other: 14.4 *12* (1997Ha30).
180.0 *3*	1.2 *6*	401.84+x	221.82+x		
182.7 *3*	3.2 *2*	401.84+x	219.21+x		
191.5‡ *3*	11.1 *2*	338.19+x	146.79+x		I_γ: other: 6.2 *7* (1997Ha30).
197.7 *3*	1.7 *4*	545.28+x	347.49+x		
201.9‡ *3*	12.0 *2*	305.99+x	104.05+x		I_γ: other: 7.7 *10* (1997Ha30).
208.0 *3*	4.6 *2*	514.25+x	305.99+x		
217.8 *3*	1.5 *4*	523.8+x	305.99+x		
219.3@‡ *3*	40.0 *6*	219.21+x	0.0+x	$(1^+,2^-)$	
219.8@‡ *3*	3.5 *6*	323.60+x	104.05+x		
221.8‡ *3*	12.0 *2*	221.82+x	0.0+x	$(1^+,2^-)$	
234.2‡ *3*	17.0 *2*	338.19+x	104.05+x		I_γ: other: 14.8 *5* (1997Ha30).
243.3 *3*	17.4 *2*	347.49+x	104.05+x		
263.2@ *3*	1.5 *4*	545.28+x	282.17+x		
263.4@ *3*	1.5 *4*	409.95+x	146.79+x		
267.3 *3*	25.3 *2*	267.45+x	0.0+x	$(1^+,2^-)$	
270.9‡ *3*	6.0 *2*	270.81+x	0.0+x	$(1^+,2^-)$	I_γ: other: 10.0 *6* (1997Ha30).

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^{128}Ce ε decay 2000Li08,1997Ha30 (continued)

γ(^{128}La) (continued)

E_γ †	I_γ †&a	E_i(level)	E_f	J_f^π	Comments
274.5‡ 3	1.7 2	545.28+x	270.81+x		
281.3 3	3.3 2	502.96+x	221.82+x		
293.0‡ 3	5.5 2	439.87+x	146.79+x		
296.3 3	1.0 3	1056.70+x	760.60+x		
x306.2# 5	4.1 6				
323.7@ 3	10.0 4	323.60+x	0.0+x	$(1^+,2^-)$	
323.8@ 3	1.0 4	545.28+x	221.82+x		
335.7‡ 3	5.7 3	439.87+x	104.05+x		
338.2‡ 3	28.5 3	338.19+x	0.0+x	$(1^+,2^-)$	I_γ: other: 16.4 7 (1997Ha30).
340.6 3	11.8 3	340.46+x	0.0+x	$(1^+,2^-)$	
373.4 3	4.0 5	520.16+x	146.79+x		
x388.3# 5	4.4 6				
396.5 3	3.0 7	916.50+x	520.16+x		
398.2 3	3.7 7	545.28+x	146.79+x		
409.7‡ 3	5.4 3	409.95+x	0.0+x	$(1^+,2^-)$	
440.1 3	4.8 7	439.87+x	0.0+x	$(1^+,2^-)$	
449.5 3	3.3 3	595.58+x	146.79+x		
x459.8# 5	1.9 3				
467.0 3	2.2 7	790.45+x	323.60+x		
473.0 3	1.2 5	620.07+x	146.79+x		
x476.3# 5	1.6 3				
502.8 3	6.9 3	502.96+x	0.0+x	$(1^+,2^-)$	
514.2 3	2.4 8	514.25+x	0.0+x	$(1^+,2^-)$	
516.3 3	6.4 3	620.07+x	104.05+x		
520.3 3	7.4 5	520.16+x	0.0+x	$(1^+,2^-)$	
534.1 3	4.4 3	681.12+x	146.79+x		
541.6 3	2.5 3	760.60+x	219.21+x		
544.9 3	38.5 4	545.28+x	0.0+x	$(1^+,2^-)$	
560.2 3	12.8 4	1105.75+x	545.28+x		
569.8 3	6.0 4	852.0+x	282.17+x		
577.3 3	3.0 7	681.12+x	104.05+x		
578.4‡ 3	3.7 4	916.50+x	338.19+x		I_γ: other: 8.6 8 (1997Ha30).
595.5 3	7.1 4	595.58+x	0.0+x	$(1^+,2^-)$	
616.1 3	4.0 4	762.9+x	146.79+x		
634.5 3	1.0 6	916.50+x	282.17+x		E_γ: other: 632.9 2 (1997Ha30).
643.5 3	3.1 6	790.45+x	146.79+x		
648.9 3	3.9 4	916.50+x	267.45+x		
655.4‡ 3	2.6 4	926.42+x	270.81+x		
659.1 3	1.9 6	926.42+x	267.45+x		
665.9‡ 3	2.6 4	1105.75+x	439.87+x		
696.1 3	2.7 4	1105.75+x	409.95+x		
707.2‡ 3	5.7 4	926.42+x	219.21+x		I_γ: other: 11 3 (1997Ha30).
709.5‡ 3	1.0 5	1056.70+x	347.49+x		I_γ: other: 3.7 10 (1997Ha30).
716.4 3	3.3 7	1056.70+x	340.46+x		
718.5‡ 3	2.1 7	1056.70+x	338.19+x		
741.5 3	1.7 6	1336.46+x	595.58+x		
769.8 3	1.6 4	916.50+x	146.79+x		
774.2‡ 3	4.7 4	1056.70+x	282.17+x		I_γ: other: 6.2 9 (1997Ha30).
780.0 3	1.2 4	926.42+x	146.79+x		
786.1 3	1.0 6	1056.70+x	270.81+x		
791.3 3	2.9 4	1138.94+x	347.49+x		
812.1‡ 3	1.3 4	916.50+x	104.05+x		I_γ: other: 4.5 19 (1997Ha30).

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^{128}Ce ε decay 2000Li08,1997Ha30 (continued)

γ(^{128}La) (continued)

E_γ [†]	I_γ [†&a]	E_i(level)	E_f	J^π_f	Comments
816.0[‡] *3*	2.9 *4*	1163.71+x	347.49+x		I_γ: other: 1.6 *3* (1997Ha30).
821.9[@] *3*	2.5 *4*	1336.46+x	514.25+x		
822.2[@] *3*	2.5 *4*	926.42+x	104.05+x		
825.6[‡] *3*	11.9 *4*	1163.71+x	338.19+x		I_γ: other: 9.5 *10* (1997Ha30).
886.4[‡] *3*	13.6 *4*	1105.75+x	219.21+x		
909.6[‡] *3*	1.8 *4*	1056.70+x	146.79+x		I_γ: other: 4.8 *11* (1997Ha30).
926.3 *3*	11.3 *4*	926.42+x	0.0+x	$(1^+,2^-)$	
952.4 *3*	7.5 *4*	1056.70+x	104.05+x		
958.8[‡] *3*	10.6 *4*	1105.75+x	146.79+x		
992.3 *3*	0.8 *4*	1138.94+x	146.79+x		
1059.5[‡] *3*	2.0 *4*	1163.71+x	104.05+x		
1106.0 *3*	6.7 *5*	1105.75+x	0.0+x	$(1^+,2^-)$	
1150.0[‡] *3*	5.1 *5*	1371.97+x	221.82+x		
1164.0 *3*	13.8	1163.71+x	0.0+x	$(1^+,2^-)$	
1189.5 *3*	2.8 *5*	1336.46+x	146.79+x		
1336.3 *3*	8.4 *6*	1336.46+x	0.0+x	$(1^+,2^-)$	
1372.1 *3*	1.9 *6*	1371.97+x	0.0+x	$(1^+,2^-)$	

[†] From 2000Li08.
[‡] Reported in 1997Ha30.
[#] Reported in 1997Ha30 but not in 2000Li08.
[@] Doublet.
[&] Relative to I(146.6γ)=100 (2000Li08).
[a] Absolute intensity per 100 decays.
[x] γ ray not placed in level scheme.

^{128}Ce ε decay 2000Li08,1997Ha30

Decay Scheme

Intensities: Relative I_γ

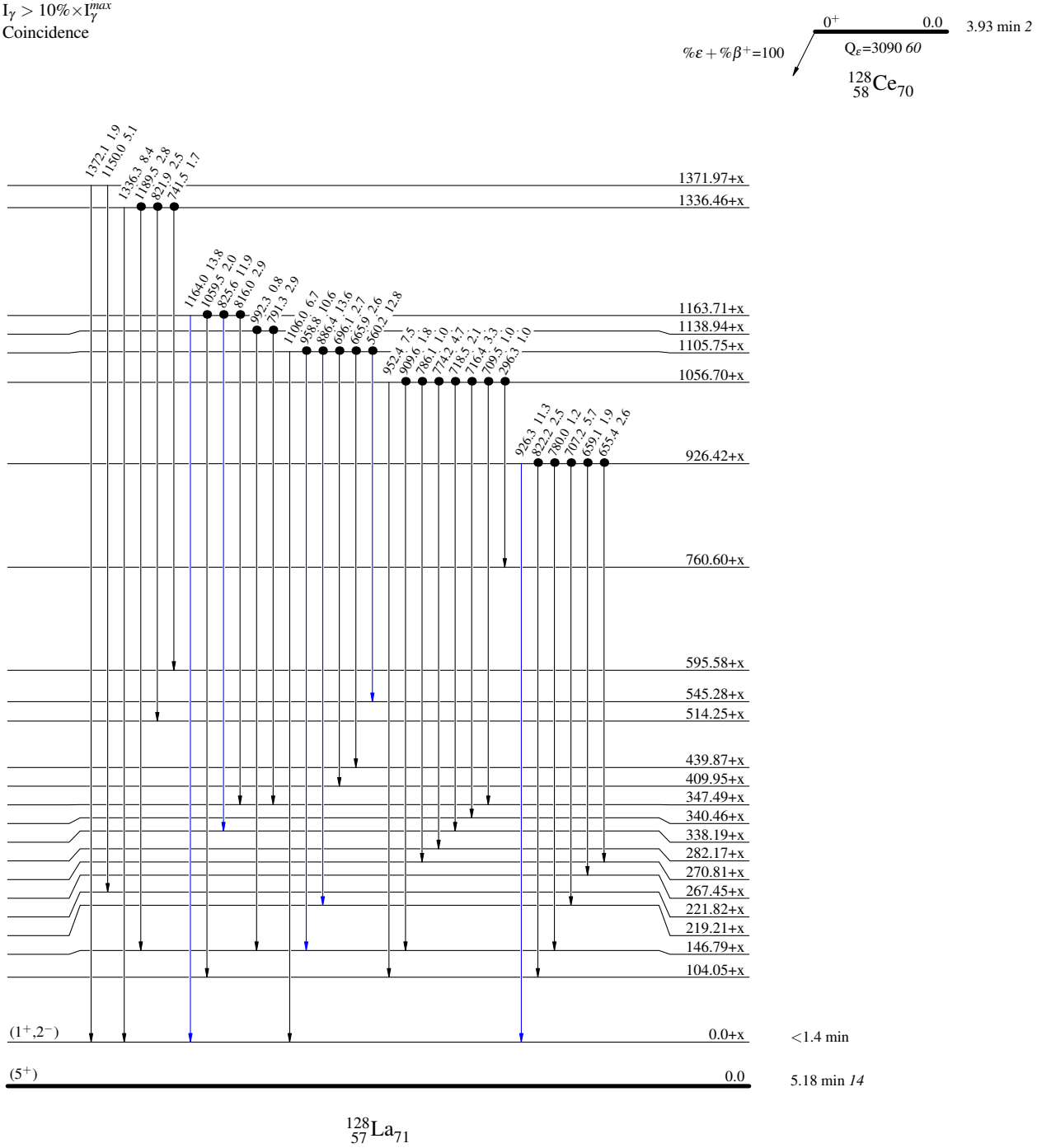
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

Coincidence



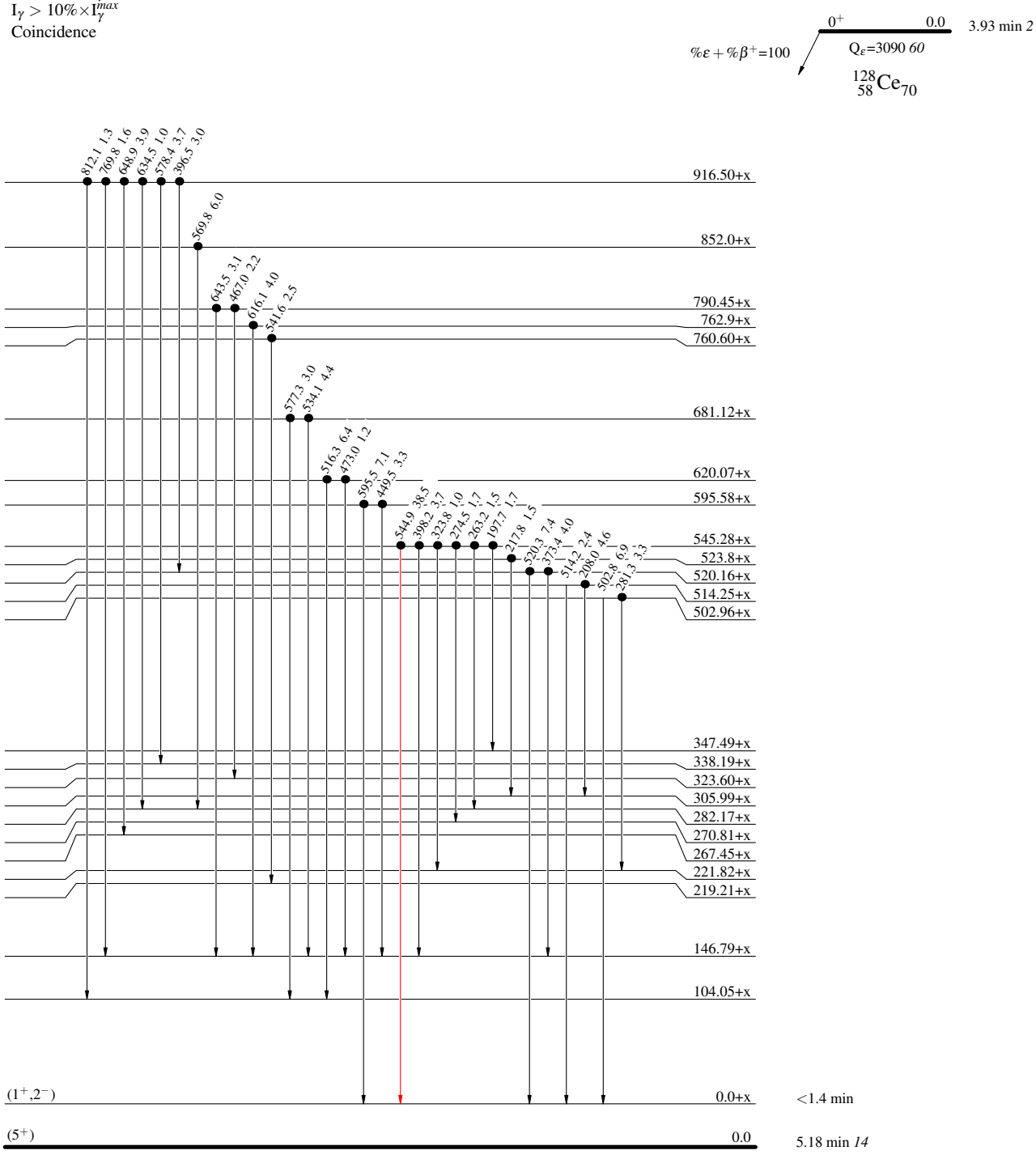
$^{128}_{57}La_{71}$

^{128}Ce ε decay 2000Li08,1997Ha30

Decay Scheme (continued)

Intensities: Relative I_γ

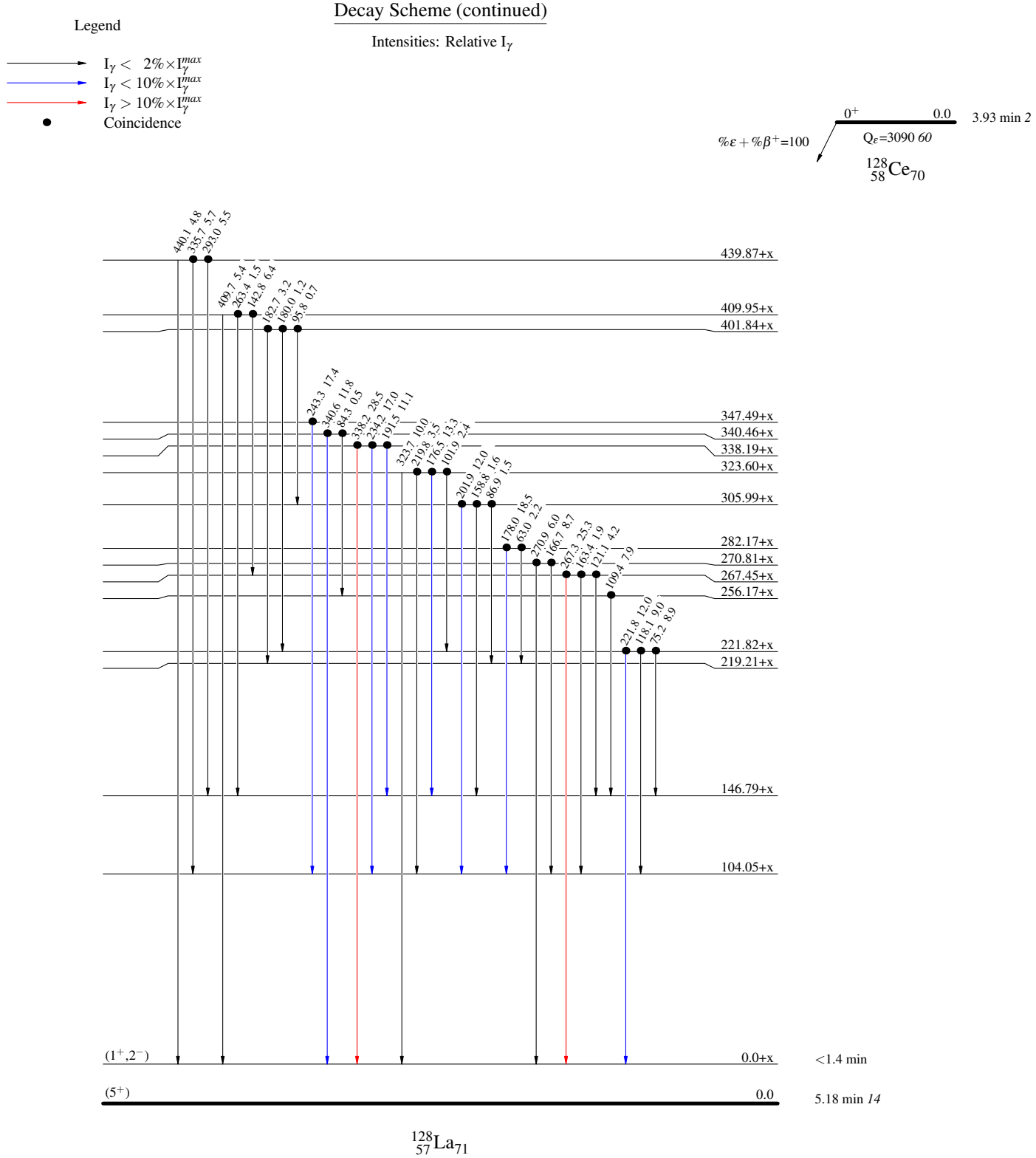
Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- Coincidence



^{128}Ce ε decay 2000Li08,1997Ha30

Decay Scheme (continued)

Intensities: Relative I_γ



^{128}Ce ε decay 2000Li08,1997Ha30

Decay Scheme (continued)

Intensities: Relative I_γ