^{145}La β^- decay 1978Pf02,1997Gr09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 110, 507 (2009)	1-Oct-2008

Parent: ^{145}La: E=0.0; J^π=(5/2$^+$); $T_{1/2}$=24.8 s *20*; Q(β^-)=4110 *80*; %β^- decay=100.0

Additional information 1.

Measured: Eγ, Iγ (1977Sk02,1982ChZV,1978Pf02), $\gamma\gamma$ coin (1978Pf02,1977Sk02),$\beta\gamma$ coin, Xγ(t), ce, β^- (1978Pf02); $\beta\gamma$ coin (1978St03); see also 1976LoZT, 1974Ar17, 1986Gr11. .

^{145}Ce Levels

E(level)	J^π‡	$T_{1/2}$	Comments
0.0	(5/2$^-$)	3.01 min *6*	
64.3 *2*	($^-$)	13 ns *3*	$T_{1/2}$: from 1978Pf02.
70.0 *2*	(7/2$^-$)		
118.2 *2*			
234.1 *3*			
355.9 *2*			
447.2 *2*			
505.7 *2*			
522.2 *3*			
632.6 *3*			
664.3 *2*			
671.8 *2*			
708.7? *3*			
840.5 *2*			
959.5 *2*			
1001.9			
1021.5			
1030.9			
1155.2 *4*			
1166.1 *4*			
1284.9 *5*			
1380†			
1480†			
1510.8 *4*			
1596.5?			
1690.0? *5*			
1780†			
1889.5 *4*			
1946.1?			
2000.0†			
2100†			
2156.0 *3*			
2200†			
2205.6 *4*			
2300†			
2359.8			
2377.1 *5*			
2400†			
2543.9 *6*			
2600†			
2606.9 *5*			
2700†			
2800†			

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^{145}La β^- decay 1978Pf02,1997Gr09 (continued)

^{145}Ce Levels (continued)

E(level)	E(level)	E(level)
2900†	3200†	3500†
3000†	3300†	3600†
3100†	3400†	3700†

† "Pseudo level" from total absorption γ-ray spectrometer measurements (1997Gr09).
‡ Adopted values.

β^- radiations

β^- feedings to the various levels are from total absorption γ-ray spectrometer measurements (1997Gr09, 1996Gr20). Values deduced from γ-ray transition intensity balances often do not agree with those presented here. This disagreement suggests the decay scheme is not complete. Notice also that about 50% of direct β^- feeding previously assigned to levels up to 118 keV has not been confirmed by the total absorption γ-ray spectrometer measurements. Other: 1992Gr21.

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(4.1×10^2 *8*)	3700	0.057	4.9	av Eβ=121 *28*
(5.1×10^2 *8*)	3600	0.085	5.0	av Eβ=156 *29*
(6.1×10^2 *8*)	3500	0.127	5.1	av Eβ=192 *30*
(7.1×10^2 *8*)	3400	0.26	5.0	av Eβ=229 *31*
(8.1×10^2 *8*)	3300	0.3	5.2	av Eβ=267 *32*
(9.1×10^2 *8*)	3200	0.34	5.3	av Eβ=307 *32*
(1.01×10^3 *8*)	3100	0.47	5.3	av Eβ=347 *33*
(1.11×10^3 *8*)	3000	0.92	5.2	av Eβ=388 *34*
(1.21×10^3 *8*)	2900	1.13	5.3	av Eβ=429 *34*
(1.31×10^3 *8*)	2800	1.27	5.3	av Eβ=471 *34*
(1.41×10^3 *8*)	2700	6.37	4.8	av Eβ=514 *35*
(1.50×10^3 *8*)	2606.9	2.07	5.3	av Eβ=554 *35*
(1.51×10^3 *8*)	2600	2.12	5.3	av Eβ=557 *35*
(1.57×10^3 *8*)	2543.9	3.68	5.2	av Eβ=581 *35*
(1.71×10^3 *8*)	2400	7.08	5.0	av Eβ=644 *36*
(1.73×10^3 *8*)	2377.1	4.25	5.3	av Eβ=654 *36*
(1.75×10^3 *8*)	2359.8	7.93	5.0	av Eβ=662 *36*
(1.81×10^3 *8*)	2300	6.37	5.2	av Eβ=688 *36*
(1.90×10^3 *8*)	2205.6	2.41	5.7	av Eβ=730 *36*
(1.91×10^3 *8*)	2200	8.92	5.1	av Eβ=732 *36*
(1.95×10^3 *8*)	2156.0	2.26	5.8	av Eβ=752 *36*
(2.01×10^3 *8*)	2100	10.33	5.1	av Eβ=777 *36*
(2.11×10^3 *8*)	2000.0	3.11	5.7	av Eβ=822 *36*
(2.16×10^3 *8*)	1946.1?	3.70	5.7	av Eβ=846 *36*
(2.22×10^3 *8*)	1889.5	6.37	5.5	av Eβ=872 *37*
(2.33×10^3 *8*)	1780	2.69	6.0	av Eβ=921 *37*
(2.42×10^3 *8*)	1690.0?	3.11	6.0	av Eβ=962 *37*
(2.51×10^3 *8*)	1596.5?	1.13	6.5	av Eβ=1005 *37*
(2.60×10^3 *8*)	1510.8	0.72	6.8	av Eβ=1044 *37*
(2.63×10^3 *8*)	1480	1.98	6.3	av Eβ=1058 *37*
(2.73×10^3 *8*)	1380	1.13	6.6	av Eβ=1104 *37*
(2.83×10^3 *8*)	1284.9	1.84	6.5	av Eβ=1147 *37*
(2.94×10^3 *8*)	1166.1	0.50	7.1	av Eβ=1202 *37*

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^{145}La β^- decay 1978Pf02,1997Gr09 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(2.95×10^3 *8*)	1155.2	0.195	7.5	av Eβ=1207 *37*
(3.09×10^3 *8*)	1021.5	0.85	7.0	av Eβ=1269 *37*
(3.11×10^3 *8*)	1001.9	0.06	8.2	av Eβ=1278 *37*
(3.15×10^3 *8*)	959.5	1.91	6.7	av Eβ=1297 *37*
(3.27×10^3 *8*)	840.5	0.35	7.5	av Eβ=1352 *37*
(3.40×10^3 *8*)	708.7?	0.20	7.8	av Eβ=1413 *38*
(3.44×10^3 *8*)	671.8	0.31	7.6	av Eβ=1430 *38*
(3.59×10^3 *8*)	522.2	0.11	8.2	av Eβ=1500 *38*
(3.60×10^3 *8*)	505.7	0.29	7.7	av Eβ=1508 *38*
(3.66×10^3 *8*)	447.2	0.71	7.4	av Eβ=1535 *38*

[†] Absolute intensity per 100 decays.

$\gamma(^{145}Ce)$

Iγ normalization: From I(355.8γ)=3.83% 67 (1986RoZT).
1978Pf02 did not see 101γ and 160γ assigned by 1969WiZX to ^{145}La β^- decay.

E$_\gamma$[†]	I$_\gamma$[‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[#]	Comments
48.2 *5*	38 *8*	118.2		70.0	(7/2$^-$)	[M1]	9.8 *4*	α(K)=8.3 *3*; α(L)=1.15 *4*; α(M)=0.241 *9*; α(N+..)=0.0628 *22* α(N)=0.0535 *19*; α(O)=0.0087 *3*; α(P)=0.000648 *22* E$_\gamma$,I$_\gamma$: observed in 1977Sk02.
64.3 *2*	27	64.3	(−)	0.0	(5/2$^-$)	E2	10.32 *19*	α(K)=3.91 *6*; α(L)=5.01 *11*; α(M)=1.127 *23*; α(N+..)=0.274 *6* α(N)=0.240 *5*; α(O)=0.0333 *7*; α(P)=0.000200 *4* I$_\gamma$: from 1986RoZU. Mult.: K/L=0.8 *2* (1978Pf02). E$_\gamma$: from ce(K), ce(L), ce(M) observed only in ce spectra (1978Pf02).
70.0 *2*	283	70.0	(7/2$^-$)	0.0	(5/2$^-$)	[M1]	3.30 *6*	α(K)=2.82 *5*; α(L)=0.387 *7*; α(M)=0.0810 *14*; α(N+..)=0.0211 *4* α(N)=0.0180 *3*; α(O)=0.00291 *5*; α(P)=0.000218 *4* Mult.: from J$^\pi$ for 70.0 and g.s.
117.1[@]		234.1		118.2				Observed only in 1977Sk02, supported by $\gamma\gamma$ from 1978Pf02, 1977Sk02.
118.2 *2*	95	118.2		0.0	(5/2$^-$)	[M1]	0.736	α(K)=0.628 *10*; α(L)=0.0856 *13*; α(M)=0.0179 *3*; α(N+..)=0.00467 *7* α(N)=0.00398 *6*; α(O)=0.000644 *10*; α(P)=4.85×10^{-5} *8*
164.1 *2*	71	234.1		70.0	(7/2$^-$)	[M1]	0.294	α(K)=0.251 *4*; α(L)=0.0340 *5*; α(M)=0.00711 *11*; α(N+..)=0.00185 *3* α(N)=0.001578 *23*; α(O)=0.000256 *4*; α(P)=1.94×10^{-5} *3*
169.8 *2*	84	234.1		64.3	(−)	[M1]	0.267	α(K)=0.228 *4*; α(L)=0.0309 *5*; α(M)=0.00647 *10*; α(N+..)=0.001685 *25* α(N)=0.001435 *21*; α(O)=0.000233 *4*; α(P)=1.76×10^{-5} *3*
[x]234.7	15							
238.0 *2*	28	355.9		118.2				
288.5 *2*	4	522.2		234.1				

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^{145}La β^- decay 1978Pf02,1997Gr09 (continued)

$\gamma(^{145}Ce)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
291.4 *2*	28	355.9		64.3	(−)	
312.0 *2*	4	1021.5		708.7?		
327.4 *2*	20	959.5		632.6		
355.8 *2*	100	355.9		0.0	(5/2−)	I_γ: Iγ=3.83% 67 (1986RoZT).
[x]360.5 *2*	25					
360.5	25	1030.9		671.8		
377.0 *2*	34	447.2		70.0	(7/2−)	
387.9 *2*	17	505.7		118.2		
403.6 *2*	25	522.2		118.2		Suggested placement disagrees with that observed in 1977Sk02 strong coin with 165γ and 117γ.
430.2 *2*	43	664.3		234.1		
435.5 *2*	44	505.7		70.0	(7/2−)	
447.4 *2*	84	447.2		0.0	(5/2−)	
452.0 *2*	14	522.2		70.0	(7/2−)	
[x]464.1	8					
484.4 *2*	19	840.5		355.9		
505.2 *2*	45	505.7		0.0	(5/2−)	
515.4 *2*	14	632.6		118.2		
515.4[@] *2*	<14	2205.6		1690.0?		
591.0 *2*	14	708.7?		118.2		
606.1 *2*	25	840.5		234.1		
632.9 *2*	38	632.6		0.0	(5/2−)	
644.8 *2*	44	708.7?		64.3	(−)	
659.0 *2*	10	1690.0?		1030.9		
664.0 *2*	13	664.3		0.0	(5/2−)	
668.2 *2*	8	1690.0?		1021.5		
671.8 *2*	48	671.8		0.0	(5/2−)	
687.9 *2*	20	1690.0?		1001.9		
721.5 *2*	20	840.5		118.2		
730.6 *2*	20	1690.0?		959.5		
[x]743.5	38					
764.1 *5*	16	2359.8		1596.5?		
[x]774.3	16					
786.5 *2*	45	1021.5		234.1		
799.5 *2*	17	1155.2		355.9		
840.7[@] *2*	<14	840.5		0.0	(5/2−)	
840.7 *2*	14	959.5		118.2		
846.5 *2*	6	1510.8		664.3		
883.5 *2*	22	1001.9		118.2		
889.6 *2*	26	959.5		70.0	(7/2−)	
895.3 *2*	13	959.5		64.3	(−)	
932.0[@] *2*	<74	1001.9		70.0	(7/2−)	
932.0 *2*	74	1166.1		234.1		
959.9 *2*	6	959.5		0.0	(5/2−)	
1021.5 *3*	36	1021.5		0.0	(5/2−)	
1030.9	46	1030.9		0.0	(5/2−)	
1036.9 *3*	21	1155.2		118.2		
1050.8 *3*	38	1284.9		234.1		
1050.8[@] *3*	<38	2205.6		1155.2		
1222.1 *5*	10	2377.1		1155.2		
1238.0	23	1946.1?		708.7?		
1596.5 *3*	31	1596.5?		0.0	(5/2−)	
1819.5 *3*	81	1889.5		70.0	(7/2−)	
1922.4 *3*	17	2156.0		234.1		
1946.1	23	1946.1?		0.0	(5/2−)	

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^{145}La β^- decay 1978Pf02,1997Gr09 (continued)

$\gamma(^{145}Ce)$ (continued)

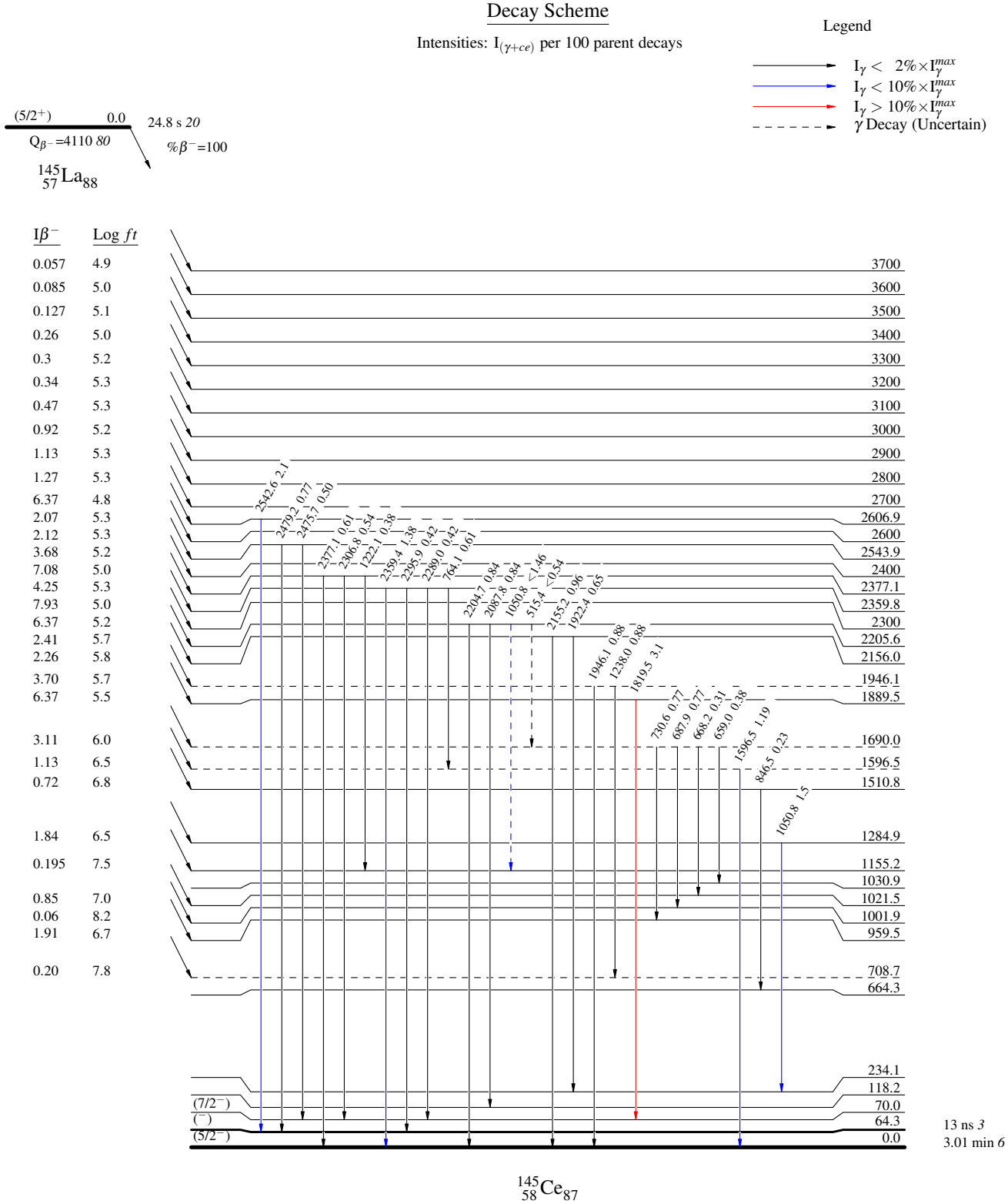
E_γ[†]	I_γ[‡]	E_i(level)	E_f	J^π_f	Comments
2087.8 *3*	22	2205.6	118.2		
2155.2 *3*	25	2156.0	0.0	$(5/2^-)$	
2204.7 *3*	22	2205.6	0.0	$(5/2^-)$	
2289.0 *3*	11	2359.8	70.0	$(7/2^-)$	
2295.9 *5*	11	2359.8	64.3	$(^-)$	
2306.8 *5*	14	2377.1	70.0	$(7/2^-)$	
[x]2351.4 *5*	15				
2359.4 *3*	36	2359.8	0.0	$(5/2^-)$	
2377.1 *5*	16	2377.1	0.0	$(5/2^-)$	
2475.7 *5*	13	2543.9	70.0	$(7/2^-)$	
2479.2 *5*	20	2543.9	64.3	$(^-)$	
[x]2526.8 *5*	8				
2542.6 *5*	54.0	2606.9	64.3	$(^-)$	I_γ: From β^- feeding to 2606.9keV level.

[†] From 1978Pf02, except where noted otherwise.
[‡] For absolute intensity per 100 decays, multiply by 0.0383 *67*.
[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[@] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{145}La β^- decay 1978Pf02,1997Gr09

Decay Scheme

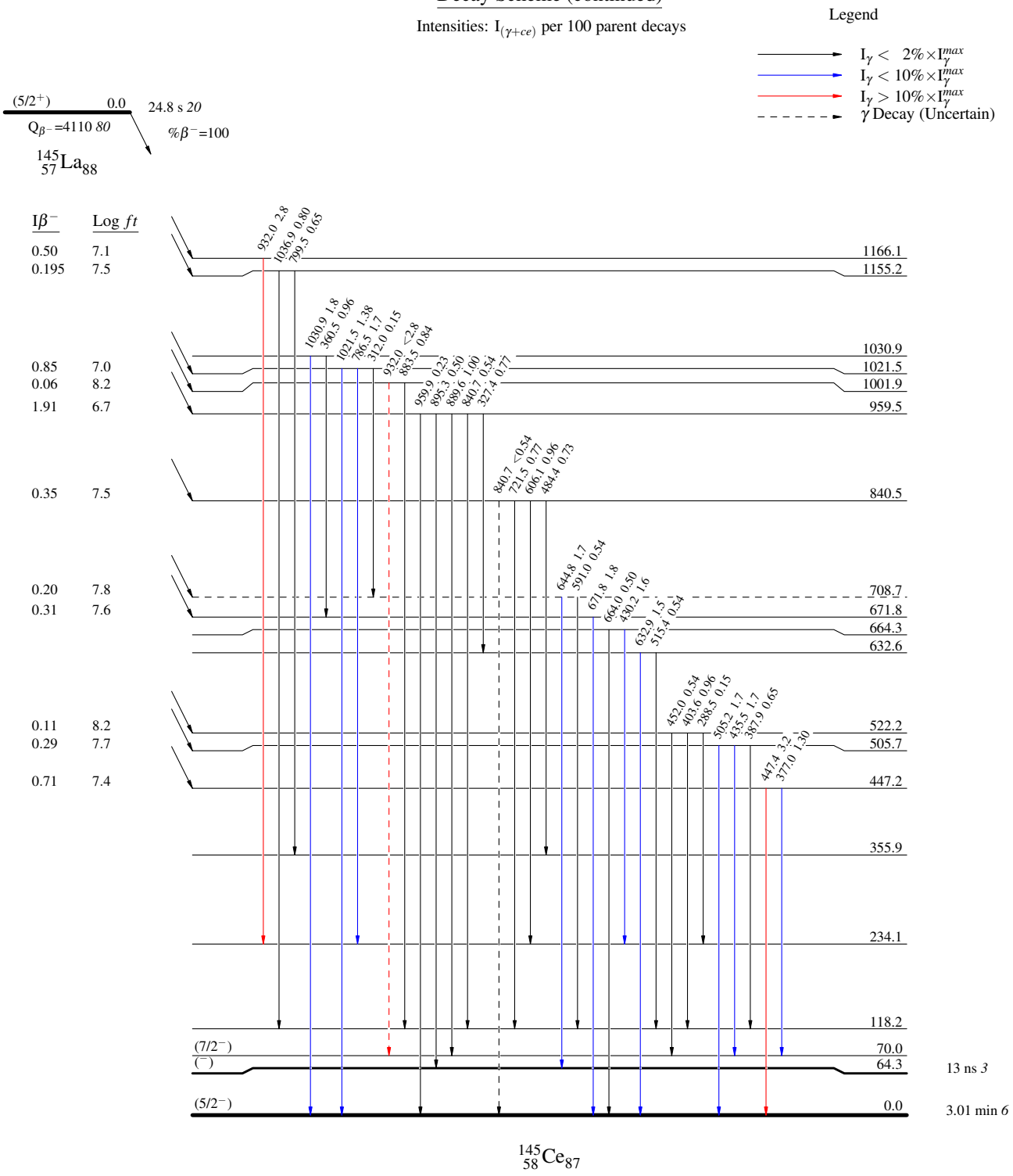
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{145}La β^- decay 1978Pf02,1997Gr09

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



^{145}La β^- decay 1978Pf02,1997Gr09

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays