(HI,xnγ) 1996Pi11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 113, 715 (2012)	31-May-2011

1996Pi11: ^{110}Pd(^{37}Cl,4nγ) E=160 MeV. Measured γ rays, γγ, γ(θ), γγ(t), DCO. Nordball 20 Compton-suppressed HPGe detector array. $T_{1/2}$ by DSA and recoil techniques. Preliminary results have been reported in: 1995Pi09, 1994Pa30, 1992Pi18.

1980MiZZ,1979RaZZ: ^{142}Nd(^{6}Li,5nγ) E=65 MeV. Measured: γ rays, γγ, γ(θ).

1988Mu12,1976Wi09: ^{144}Sm(α,p4nγ) E=95 MeV (1988Mu12), 75-120 MeV (1976Wi09) measured: γ, γγ, γ(θ) (1988Mu12,1976Wi09), γ(t) (1988Mu12).

All data are from 1996Pi11 unless indicated otherwise. Authors have confirmed level scheme seen in ^{144}Sm(α,p4nγ) and ^{142}Nd(^{6}Li,5nγ) and extended it to 75/2 level. Levels at 3112 (552γ), 3294 (182γ), 3470 (176γ), 3629 (159γ) reported in (^{6}Li,5nγ) and 4494 (176γ) reported in (α,p4nγ) have not been confirmed and their depopulating transitions have been placed elsewhere. π for the following levels have been changed by 1996Pi11: 1908, 2457, 2457, 2474, 2559, 2612, 2811.

^{143}Eu Levels

E(level)[†]	Jπ[#]	$T_{1/2}$	Comments
0	5/2$^+$		
271.9	7/2$^+$		
389.51 *4*	11/2$^-$	50 μs	Additional information 1.
977.5[‡] *10*	(9/2)$^-$		
1057.55 *15*	13/2$^-$		
1187.5[‡] *10*	11/2$^-$		
1305.90 *16*	15/2$^-$		
1894.22 *24*	15/2$^-$		
1908.1 *5*	15/2$^+$		
2116.27 *19*	17/2$^-$		
2318.1 *3*	19/2$^-$		
2329.03 *22*	17/2$^-$		
2378.15 *20*	19/2$^-$		
2457.42 *19*	17/2$^+$		
2473.8 *3*	21/2$^{(-)}$	5.8[@] ns *15*	
2559.20 *19*	19/2$^+$	7.4 ps *4*	
2611.99 *22*	21/2$^-$		
2629.67 *19*	21/2$^+$	9.7 ps *21*	
2811.47 *21*	23/2$^+$	2.6 ps *10*	
3011.5 *4*	23/2$^-$		
3343.4 *3*	25/2$^+$	<3.5 ps	
3364.1 *3*	25/2$^+$	<2.8 ps	
3414.2 *6*	(25/2)		
3603.7 *5*	23/2$^-$		
3688.8 *3*	25/2$^-$		
3748.9 *3*	27/2$^+$	4.2 ps *14*	
3761.4 *4*	27/2$^+$		
3787.9 *4*	(27/2)		
3963.1 *5*	27/2$^+$		
4091.3 *5*	(29/2)		
4167.9[&] *3*	27/2$^-$		
4215.7 *5*	(29/2)		
4318.5 *3*	29/2$^+$	2.0 ps *2*	
4397.1 *3*	29/2$^+$		
4472.9 *5*	27/2$^-$		
4477.8 *3*	31/2$^+$	7.9 ps *3*	
4562.9 *6*	(31/2)		
4565.7 *5*	31/2$^+$		

Continued on next page (footnotes at end of table)

(HI,xnγ) 1996Pi11 (continued)

^{143}Eu Levels (continued)

E(level)†	Jπ#	$T_{1/2}$	E(level)†	Jπ#	$T_{1/2}$	E(level)†	Jπ#	$T_{1/2}$
4653.5 *4*	$33/2^+$	6 ps *2*	6694.7 *5*	$41/2^{(+)}$		8014.0 *8*	47/2	
4786.6 *5*	$31/2^+$		6709.5 *6*	39/2		8213.7 *6*	$47/2^{(-)}$	
4946.8 *4*	$35/2^{(+)}$	<2.1 ps	6747.8 *7*			8264.0 *6*	$47/2^{(+)}$	
5051.7& *4*	$31/2^-$	<7 ps	6815.3 *7*	43/2		8485.6 *7*	49/2	
5074.8 *6*	(31/2)		6840.5& *5*	$39/2^-$	<0.7 ps	8655.9 *13*		
5107.0 *4*	$33/2^{(+)}$		6871.4 *8*	$43/2^+$		8730.8 *7*	$49/2^{(-)}$	
5130.7 *7*	$35/2^+$		6881.8 *8*	$43/2^+$		8794.2[b] *8*	$(51/2^-)$	
5190.7& *5*	$31/2^-$		6975.6 *5*	$41/2^{(-)}$		8870.1& *6*	$51/2^-$	0.4 ps *1*
5243.5 *5*	$33/2^{(-)}$		7024.2 *6*	$41/2^{(-)}$		8944.2 *7*	51/2	
5245.8 *5*	$37/2^{(-)}$		7152.3 *8*	45/2		8972.3 *6*	49/2	
5328.6 *4*	$33/2^{(+)}$		7154.3 *5*	$43/2^{(+)}$		9295.5 *9*	$51/2^{(-)}$	
5381.9 *5*	$37/2^{(-)}$		7214.7 *5*	$43/2^{(+)}$		9364.6 *8*	53/2	
5411.4 *4*	$35/2^{(-)}$		7248.8 *8*	45/2		9444.0[b] *9*	$(55/2^-)$	
5419.3 *4*	$35/2^{(-)}$		7273.7 *6*	$41/2^{(-)}$		9568.0[a] *6*	53/2	
5587.1 *5*	$37/2^{(-)}$		7288.8 *6*	$43/2^{(-)}$		9977.7& *6*	$55/2^-$	<0.4 ps
5722.5 *6*	$35/2^{(-)}$		7342.1 *6*	43/2		10415.6[a] *7*	57/2	
5792.4 *4*	$35/2^{(+)}$		7388.5& *5*	$43/2^-$	6.4 ps *3*	10439.2[b] *10*	$(59/2^-)$	
5799.4 *7*	$37/2^{(-)}$		7389.6 *9*	45/2		10624.1& *7*	$59/2^-$	
5848.1 *5*	$39/2^{(-)}$		7448.7 *6*	$45/2^{(+)}$		11227.4& *7*	$59/2^-$	<0.4 ps
5869.3 *4*	$35/2^{(+)}$		7501.4 *5*	$43/2^{(-)}$		11512.9[a] *8*	61/2	
5904.6& *4*	$35/2^-$	<0.7 ps	7577.2 *9*	47/2		11852.3[b] *11*	$(63/2^-)$	
5939.3 *7*	$39/2^+$		7659.7 *6*	$45/2^{(+)}$		12018.6& *8*	$63/2^-$	<0.4 ps
6001.0 *6*	$39/2^{(-)}$		7693.7 *7*	45/2		12824.6[a] *9*	65/2	
6055.8 *5*	$39/2^{(-)}$		7701.8 *9*	$47/2^+$		12974.4& *9*	$67/2^-$	0.15 ps *4*
6057.7 *4*	$37/2^{(+)}$		7726.7 *6*	$45/2^{(+)}$		13036.3[b] *15*		
6316.3 *6*	41/2		7768.9 *9*	$47/2^+$		14159.9& *9*	$71/2^-$	<0.2 ps
6333.2 *5*	$39/2^{(+)}$		7804.7 *5*	$45/2^{(-)}$		14293.6[a] *14*		
6363.0 *5*	$39/2^{(-)}$		7925.6 *7*	47/2		15551.0& *11*	$75/2^-$	
6365.0 *5*	$41/2^{(-)}$		7942.6 *9*	47/2		15590.4& *11*	$75/2^-$	
6556.3 *6*	$41/2^{(-)}$		8003.5& *6*	$47/2^-$	2.1 ps *2*			

† From least-squares fit to Eγ.

‡ Seen in ^{144}Sm(α,p4nγ) by 1976Wi09, not reported in 1996Pi11.

From DCO ratios, excit, band assignment. A DCO ratio of 1.4 is taken typically to represent ΔJ=2 for Q or ΔJ=0 for D transition. A ratio of 0.8 typically represents ΔJ=1.

@ From (α,p4nγ) (1988Mu12).

& Band(A): Cascade-1, π=− although cascade is well established the decreased intensity of lower three members of the cascade indicates alternate decay paths via weaker transitions not seen here.

[a] Band(B): cascade-2, possibly π=(+).

[b] Band(C): cascade-3.

(HI,xnγ) 1996Pi11 (continued)

γ(^{143}Eu)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ	α[†]	Comments
70.5 *1*	85	2629.67	21/2$^+$	2559.20	19/2$^+$	M1		5.06	α(K)=4.27 *7*; α(L)=0.615 *9*; α(M)=0.1329 *20*; α(N+..)=0.0357 *6* α(N)=0.0304 *5*; α(O)=0.00482 *7*; α(P)=0.000474 *7* B(M1)(W.u.)=0.82 *18*
76.9 *4*	6	5799.4	37/2$^{(-)}$	5722.5	35/2$^{(-)}$				
77.0 *4*	4	5869.3	35/2$^{(+)}$	5792.4	35/2$^{(+)}$				
80.7 *2*	13	4477.8	31/2$^+$	4397.1	29/2$^+$	M1		3.42 *6*	α(K)=2.89 *5*; α(L)=0.415 *7*; α(M)=0.0897 *15*; α(N+..)=0.0241 *4* α(N)=0.0205 *4*; α(O)=0.00325 *6*; α(P)=0.000320 *5* B(M1)(W.u.)=0.163 *7*
99.1 *2*	17	3787.9	(27/2)	3688.8	25/2$^-$				
101.8 *1*	81	2559.20	19/2$^+$	2457.42	17/2$^+$	M1(+E2)	+0.09[&] *14*	1.76 *4*	α(K)=1.48 *3*; α(L)=0.22 *3*; α(M)=0.047 *7*; α(N+..)=0.0127 *17* α(N)=0.0108 *16*; α(O)=0.00170 *20*; α(P)=0.000163 *5* B(M1)(W.u.)=0.40 *3*; B(E2)(W.u.)=1.8×10^2 *+56−18*
138.2 *2*	12	2611.99	21/2$^-$	2473.8	21/2$^{(-)}$				
155.8 *3*	8	2473.8	21/2$^{(-)}$	2318.1	19/2$^-$	D			
156 *1*	6	2629.67	21/2$^+$	2473.8	21/2$^{(-)}$	D			
159.3 *1*	214	4477.8	31/2$^+$	4318.5	29/2$^+$	M1(+E2)	+0.00[&] *+9−7*	0.494	α(K)=0.418 *6*; α(L)=0.0594 *10*; α(M)=0.01283 *23*; α(N+..)=0.00345 *6* α(N)=0.00294 *5*; α(O)=0.000466 *8*; α(P)=4.62×10^{-5} *7* B(M1)(W.u.)=(0.349 *14*)
167.8 *3*	48	5587.1	37/2$^{(-)}$	5419.3	35/2$^{(-)}$				
168 *1*		5411.4	35/2$^{(-)}$	5243.5	33/2$^{(-)}$				
169 *1*		5243.5	33/2$^{(-)}$	5074.8	(31/2)				
175.7 *5*	≈30	5587.1	37/2$^{(-)}$	5411.4	35/2$^{(-)}$				
175.8 *2*	270	4653.5	33/2$^+$	4477.8	31/2$^+$	M1(+E2)	−0.02[&] *19*	0.375	α(K)=0.318 *6*; α(L)=0.0451 *17*; α(M)=0.0097 *5*; α(N+..)=0.00262 *10* α(N)=0.00223 *9*; α(O)=0.000354 *12*; α(P)=3.51×10^{-5} *9* B(M1)(W.u.)=(0.49 *17*); B(E2)(W.u.)=(4 *+70−4*)
181.8 *1*	615	2811.47	23/2$^+$	2629.67	21/2$^+$	M1		0.342	α(K)=0.290 *4*; α(L)=0.0411 *6*; α(M)=0.00887 *13*; α(N+..)=0.00239 *4* α(N)=0.00203 *3*; α(O)=0.000322 *5*; α(P)=3.20×10^{-5} *5* B(M1)(W.u.)=1.0 *4*
187.6 *2*	11	7577.2	47/2	7389.6	45/2				
188.4 *2*	41	6057.7	37/2$^{(+)}$	5869.3	35/2$^{(+)}$				
199.5 *2*	38	2811.47	23/2$^+$	2611.99	21/2$^-$	E1		0.0441	α(K)=0.0374 *6*; α(L)=0.00525 *8*; α(M)=0.001128 *16*; α(N+..)=0.000298 *5* α(N)=0.000256 *4*; α(O)=3.94×10^{-5} *6*; α(P)=3.42×10^{-6} *5* B(E1)(W.u.)=0.00053 *21*
221.6 *3*	39	8485.6	49/2	8264.0	47/2$^{(+)}$				
227.6 *4*	10	7501.4	43/2$^{(-)}$	7273.7	41/2$^{(-)}$				
230.2 *2*	31	2559.20	19/2$^+$	2329.03	17/2$^-$	E1		0.0302	α(K)=0.0257 *4*; α(L)=0.00357 *5*; α(M)=0.000768 *11*; α(N+..)=0.000204 *3* α(N)=0.0001742 *25*; α(O)=2.69×10^{-5} *4*; α(P)=2.38×10^{-6} *4* B(E1)(W.u.)=0.000150 *9*

From ENSDF

$^{143}_{63}Eu_{80}$-3

γ(^{143}Eu) (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[†]	Comments
233.9 *2*	69	2611.99	21/2$^-$	2378.15	19/2$^-$			
234.0 *5*	12	7448.7	45/2$^{(+)}$	7214.7	43/2$^{(+)}$			
239.1 *4*	10	7214.7	43/2$^{(+)}$	6975.6	41/2$^{(-)}$			
248.3 *2*	46	1305.90	15/2$^-$	1057.55	13/2$^-$			
251.5 *1*	145	2629.67	21/2$^+$	2378.15	19/2$^-$	E1	0.0240	α(K)=0.0204 *3*; α(L)=0.00283 *4*; α(M)=0.000607 *9*; α(N+..)=0.0001612 *23* α(N)=0.0001379 *20*; α(O)=2.14×10^{-5} *3*; α(P)=1.91×10^{-6} *3* B(E1)(W.u.)=0.00035 *8*
261.0 *2*	53	5848.1	39/2$^{(-)}$	5587.1	37/2$^{(-)}$			
265.3 *2*	54	6057.7	37/2$^{(+)}$	5792.4	35/2$^{(+)}$	E2,M1	0.104 *19*	α(K)=0.084 *20*; α(L)=0.0154 *9*; α(M)=0.0034 *3*; α(N+..)=0.00090 *6* α(N)=0.00077 *6*; α(O)=0.000117 *4*; α(P)=9.E−6 *3*
266.0 *4*	10	6975.6	41/2$^{(-)}$	6709.5	39/2			
275.5 *2*	114	6333.2	39/2$^{(+)}$	6057.7	37/2$^{(+)}$	E2,M1	0.093 *18*	α(K)=0.076 *18*; α(L)=0.0136 *6*; α(M)=0.00301 *19*; α(N+..)=0.00079 *4* α(N)=0.00068 *4*; α(O)=0.0001037 *17*; α(P)=7.8×10^{-6} *25*
293.3 *2*	123	4946.8	35/2$^{(+)}$	4653.5	33/2$^+$	(M1)	0.0934	α(K)=0.0793 *12*; α(L)=0.01109 *16*; α(M)=0.00239 *4*; α(N+..)=0.000644 *9* α(N)=0.000548 *8*; α(O)=8.71×10^{-5} *13*; α(P)=8.69×10^{-6} *13* B(M1)(W.u.)>0.38
294.4 *4*	10	7448.7	45/2$^{(+)}$	7154.3	43/2$^{(+)}$			
298.9 *4*	12	5245.8	37/2$^{(-)}$	4946.8	35/2$^{(+)}$			
303.3 *3*	28	7804.7	45/2$^{(-)}$	7501.4	43/2$^{(-)}$			
303.4 *4*	35	4091.3	(29/2)	3787.9	(27/2)			
313.4 *4*	15	7288.8	43/2$^{(-)}$	6975.6	41/2$^{(-)}$			
315.3 *3*	41	6316.3	41/2	6001.0	39/2$^{(-)}$			
317.9 *4*	10	7342.1	43/2	7024.2	41/2$^{(-)}$			
320.3 *3*	18	8014.0	47/2	7693.7	45/2			
337.0 *4*	10	7152.3	45/2	6815.3	43/2			
351.6 *4*	22	7693.7	45/2	7342.1	43/2			
361.5 *2*	128	6694.7	41/2$^{(+)}$	6333.2	39/2$^{(+)}$	E2,M1	0.043 *11*	α(K)=0.036 *10*; α(L)=0.0059 *5*; α(M)=0.00129 *9*; α(N+..)=0.00034 *3* α(N)=0.000292 *22*; α(O)=4.5×10^{-5} *5*; α(P)=3.8×10^{-6} *13*
371.0 *4*	10	7659.7	45/2$^{(+)}$	7288.8	43/2$^{(-)}$			
381.8 *5*	10	3011.5	23/2$^-$	2629.67	21/2$^+$			
384.9 *2*	206	3748.9	27/2$^+$	3364.1	25/2$^+$	M1	0.0457	α(K)=0.0388 *6*; α(L)=0.00539 *8*; α(M)=0.001161 *17*; α(N+..)=0.000312 *5* α(N)=0.000266 *4*; α(O)=4.23×10^{-5} *6*; α(P)=4.24×10^{-6} *6* B(M1)(W.u.)=0.062 *21*
397.4 *3*	20	3761.4	27/2$^+$	3364.1	25/2$^+$			
399.5 *4*	16	3011.5	23/2$^-$	2611.99	21/2$^-$			
405.5 *2*	85	3748.9	27/2$^+$	3343.4	25/2$^+$	M1	0.0399	α(K)=0.0339 *5*; α(L)=0.00470 *7*; α(M)=0.001012 *15*; α(N+..)=0.000272 *4* α(N)=0.000232 *4*; α(O)=3.69×10^{-5} *6*; α(P)=3.70×10^{-6} *6* B(M1)(W.u.)=0.022 *8*
409.0 *3*	48	8213.7	47/2$^{(-)}$	7804.7	45/2$^{(-)}$			
413.9 *3*	65	6001.0	39/2$^{(-)}$	5587.1	37/2$^{(-)}$			
420.4 *4*	22	9364.6	53/2	8944.2	51/2			

From ENSDF

$^{143}_{63}Eu_{80}$-4

(HI,xnγ) 1996Pi11 (continued)

γ(^{143}Eu) (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ	α[†]	Comments
427.8 *3*	58	4215.7	(29/2)	3787.9	(27/2)				
433.5 *4*	10	7248.8	45/2	6815.3	43/2				
435.3 *4*	12	5381.9	$37/2^{(-)}$	4946.8	$35/2^{(+)}$				
442.9 *2*	311	2559.20	$19/2^+$	2116.27	$17/2^-$	E1(+M2)	+0.00[&] *5*	0.0060 *3*	α=0.0060 *3*; α(K)=0.00508 *23*; α(L)=0.00068 *4*; α(M)=0.000147 *8*; α(N+..)=3.91×10^{-5} *22* α(N)=3.34×10^{-5} *18*; α(O)=5.2×10^{-6} *3*; α(P)=5.0×10^{-7} *3* B(E1)(W.u.)=(0.000211 *12*)
456.9 *4*	22	5243.5	$33/2^{(-)}$	4786.6	$31/2^+$				
458.6 *3*	30	8944.2	51/2	8485.6	49/2				
459.5 *2*	76	7154.3	$43/2^{(+)}$	6694.7	$41/2^{(+)}$	E2,M1		0.023 *6*	α(K)=0.019 *6*; α(L)=0.0029 *5*; α(M)=0.00064 *10*; α(N+..)=0.00017 *3* α(N)=0.000146 *22*; α(O)=2.3×10^{-5} *4*; α(P)=2.0×10^{-6} *7*
463.6 *3*	38	5792.4	$35/2^{(+)}$	5328.6	$33/2^{(+)}$	E2,M1		0.022 *6*	α(K)=0.019 *6*; α(L)=0.0029 *5*; α(M)=0.00062 *10*; α(N+..)=0.00017 *3* α(N)=0.000142 *22*; α(O)=2.2×10^{-5} *4*; α(P)=2.0×10^{-6} *7*
468.8 *3*	31	6055.8	$39/2^{(-)}$	5587.1	$37/2^{(-)}$				
471.6 *4*	18	4562.9	(31/2)	4091.3	(29/2)				
476.9 *4*	18	7925.6	47/2	7448.7	$45/2^{(+)}$				
495.6 *3*	23	2611.99	$21/2^-$	2116.27	$17/2^-$				
499.0 *3*	28	6815.3	43/2	6316.3	41/2				
500.5 *4*	16	6556.3	$41/2^{(-)}$	6055.8	$39/2^{(-)}$				
516.9 *4*	50	6365.0	$41/2^{(-)}$	5848.1	$39/2^{(-)}$				
517.1 *4*	38	8730.8	$49/2^{(-)}$	8213.7	$47/2^{(-)}$				
531.9 *2*	252	3343.4	$25/2^+$	2811.47	$23/2^+$	M1		0.0200	α(K)=0.01699 *24*; α(L)=0.00233 *4*; α(M)=0.000502 *7*; α(N+..)=0.0001351 *19* α(N)=0.0001149 *17*; α(O)=1.83×10^{-5} *3*; α(P)=1.84×10^{-6} *3* B(M1)(W.u.)>0.041
537.2 *4*	16	8264.0	$47/2^{(+)}$	7726.7	$45/2^{(+)}$	E2,M1		0.015 *5*	α(K)=0.013 *4*; α(L)=0.0019 *4*; α(M)=0.00041 *8*; α(N+..)=0.000111 *21* α(N)=9.5×10^{-5} *18*; α(O)=1.5×10^{-5} *3*; α(P)=1.4×10^{-6} *5*
548.0 *2*	340	7388.5	$43/2^-$	6840.5	$39/2^-$	E2		0.01054	α(K)=0.00867 *13*; α(L)=0.001463 *21*; α(M)=0.000321 *5*; α(N+..)=8.49×10^{-5} *12* α(N)=7.29×10^{-5} *11*; α(O)=1.114×10^{-5} *16*; α(P)=8.70×10^{-7} *13* B(E2)(W.u.)=39.9 *19*
549.0 *5*	5	3963.1	$27/2^+$	3414.2	(25/2)				
549.3 *6*	24	2457.42	$17/2^+$	1908.1	$15/2^+$				
552.6 *2*	471	3364.1	$25/2^+$	2811.47	$23/2^+$	M1(+E2)	−0.13[&] *+10−11*	0.0180 *4*	α(K)=0.0153 *4*; α(L)=0.00210 *4*; α(M)=0.000453 *9*; α(N+..)=0.0001219 *23* α(N)=0.0001037 *20*; α(O)=1.65×10^{-5} *4*; α(P)=1.66×10^{-6} *4* B(M1)(W.u.)>0.044
557.2 *4*	23	4318.5	$29/2^+$	3761.4	$27/2^+$	M1		0.0178	α(K)=0.01512 *22*; α(L)=0.00207 *3*; α(M)=0.000446 *7*; α(N+..)=0.0001200 *17*

From ENSDF

$^{143}_{63}Eu_{80}$-5

(HI,xnγ) 1996Pi11 (continued)

γ(^{143}Eu) (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ	α[†]	Comments
									α(N)=0.0001021 *15*; α(O)=1.625×10^{-5} *23*; α(P)=1.638×10^{-6} *24* B(M1)(W.u.)=0.0044 *5*
563.3 *4*	50	2457.42	17/2$^+$	1894.22	15/2$^-$				
564.7 *5*	16	9295.5	51/2$^{(-)}$	8730.8	49/2$^{(-)}$				
565.0 *4*	40	5130.7	35/2$^+$	4565.7	31/2$^+$				
569.6 *2*	169	4318.5	29/2$^+$	3748.9	27/2$^+$	M1		0.01680	α(K)=0.01431 *20*; α(L)=0.00196 *3*; α(M)=0.000421 *6*; α(N+..)=0.0001134 *16* α(N)=9.65×10^{-5} *14*; α(O)=1.536×10^{-5} *22*; α(P)=1.550×10^{-6} *22* B(M1)(W.u.)=0.030 *3*
572.2 *4*	25	7726.7	45/2$^{(+)}$	7154.3	43/2$^{(+)}$	E2,M1		0.013 *4*	α(K)=0.011 *4*; α(L)=0.0016 *4*; α(M)=0.00035 *7*; α(N+..)=9.4×10^{-5} *19* α(N)=8.0×10^{-5} *16*; α(O)=1.3×10^{-5} *3*; α(P)=1.2×10^{-6} *4*
574.3 *5*	13	7389.6	45/2	6815.3	43/2				
578.8 *4*	40	5051.7	31/2$^-$	4472.9	27/2$^-$	E2		0.00917 *13*	α=0.00917 *13*; α(K)=0.00757 *11*; α(L)=0.001252 *18*; α(M)=0.000274 *4*; α(N+..)=7.26×10^{-5} *11* α(N)=6.23×10^{-5} *9*; α(O)=9.56×10^{-6} *14*; α(P)=7.63×10^{-7} *11* B(E2)(W.u.)>4.8
588[@]		977.5	(9/2)$^-$	389.51	11/2$^-$	D			
595.6 *4*	21	9568.0	53/2	8972.3	49/2				
599.0 *5*	12	3963.1	27/2$^+$	3364.1	25/2$^+$				
602.1 *6*	31	1908.1	15/2$^+$	1305.90	15/2$^-$				
602.6 *4*	39	4565.7	31/2$^+$	3963.1	27/2$^+$				
602.8 *5*	8	11227.4	59/2$^-$	10624.1	59/2$^-$				
603 *1*		3414.2	(25/2)	2811.47	23/2$^+$				
604.5 *4*	10	8264.0	47/2$^{(+)}$	7659.7	45/2$^{(+)}$				
615.0 *2*	341	8003.5	47/2$^-$	7388.5	43/2$^-$	E2		0.00789 *11*	α=0.00789 *11*; α(K)=0.00654 *10*; α(L)=0.001058 *15*; α(M)=0.000231 *4*; α(N+..)=6.13×10^{-5} *9* α(N)=5.26×10^{-5} *8*; α(O)=8.09×10^{-6} *12*; α(P)=6.61×10^{-7} *10* B(E2)(W.u.)=69 *7*
629.1 *3*	21	5107.0	33/2$^{(+)}$	4477.8	31/2$^+$				
646.2 *4*	11	10624.1	59/2$^-$	9977.7	55/2$^-$				
648.2 *4*	14	4397.1	29/2$^+$	3748.9	27/2$^+$				
649.8 *4*		9444.0	(55/2$^-$)	8794.2	(51/2$^-$)				
650.3 *3*	25	7804.7	45/2$^{(-)}$	7154.3	43/2$^{(+)}$				
661.3 *4*	10	7024.2	41/2$^{(-)}$	6363.0	39/2$^{(-)}$				
668.0 *2*	368	1057.55	13/2$^-$	389.51	11/2$^-$	M1+E2	−0.75[&] *+23−73*	0.0096 *16*	α=0.0096 *16*; α(K)=0.0081 *14*; α(L)=0.00114 *16*; α(M)=0.00025 *4*; α(N+..)=6.6×10^{-5} *9* α(N)=5.6×10^{-5} *8*; α(O)=8.9×10^{-6} *13*; α(P)=8.6×10^{-7} *17*
675.0 *3*	27	5328.6	33/2$^{(+)}$	4653.5	33/2$^+$				

From ENSDF

$^{143}_{63}Eu_{80}$-6

(HI,xnγ) 1996Pi11 (continued)

γ(^{143}Eu) (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[†]	Comments
680.5 *5*	5	5243.5	$33/2^{(-)}$	4562.9	(31/2)			
685.3 *3*	18	5792.4	$35/2^{(+)}$	5107.0	$33/2^{(+)}$			
693.8 *4*	8	7942.6	47/2	7248.8	45/2			
697.9 *2*	81	9568.0	53/2	8870.1	$51/2^-$			
713.9 *3*	24	5904.6	$35/2^-$	5190.7	$31/2^-$	E2	0.00552 *8*	α=0.00552 *8*; α(K)=0.00461 *7*; α(L)=0.000712 *10*; α(M)=0.0001551 *22*; α(N+..)=4.12×10^{-5} *6* α(N)=3.53×10^{-5} *5*; α(O)=5.47×10^{-6} *8*; α(P)=4.70×10^{-7} *7* B(E2)(W.u.)>8.5
717.9 *4*	12	5190.7	$31/2^-$	4472.9	$27/2^-$			
728.8 *2*	46	4477.8	$31/2^+$	3748.9	$27/2^+$	E2	0.00526 *8*	α=0.00526 *8*; α(K)=0.00440 *7*; α(L)=0.000675 *10*; α(M)=0.0001470 *21*; α(N+..)=3.91×10^{-5} *6* α(N)=3.35×10^{-5} *5*; α(O)=5.19×10^{-6} *8*; α(P)=4.49×10^{-7} *7* B(E2)(W.u.)=0.85 *4*
757.8 *3*	38	5411.4	$35/2^{(-)}$	4653.5	$33/2^+$			
762.2 *4*	11	5869.3	$35/2^{(+)}$	5107.0	$33/2^{(+)}$			
765.8 *2*	73	5419.3	$35/2^{(-)}$	4653.5	$33/2^+$			
775.9 *3*	22	6363.0	$39/2^{(-)}$	5587.1	$37/2^{(-)}$			
785.9 *5*	5	7342.1	43/2	6556.3	$41/2^{(-)}$			
790.7 *5*		8794.2	$(51/2^-)$	8003.5	$47/2^-$			
791.1 *4*	31	12018.6	$63/2^-$	11227.4	$59/2^-$	E2	0.00436 *7*	α=0.00436 *7*; α(K)=0.00366 *6*; α(L)=0.000550 *8*; α(M)=0.0001194 *17*; α(N+..)=3.18×10^{-5} *5* α(N)=2.72×10^{-5} *4*; α(O)=4.23×10^{-6} *6*; α(P)=3.74×10^{-7} *6* B(E2)(W.u.)>66
798[@]		1187.5	$11/2^-$	389.51	$11/2^-$	Q+D		
803.9 *3*	182	4167.9	$27/2^-$	3364.1	$25/2^+$			
804.2 *5*	35	4565.7	$31/2^+$	3761.4	$27/2^+$			
806.8 *3*	38	7501.4	$43/2^{(-)}$	6694.7	$41/2^{(+)}$			
808.6 *3*	60	5939.3	$39/2^+$	5130.7	$35/2^+$			
810.2 *3*	85	2116.27	$17/2^-$	1305.90	$15/2^-$			
815.3 *5*	13	8264.0	$47/2^{(+)}$	7448.7	$45/2^{(+)}$			
824.4 *5*	7	4167.9	$27/2^-$	3343.4	$25/2^+$			
830.4 *4*	19	7701.8	$47/2^+$	6871.4	$43/2^+$			
836.6 *3*	30	1894.22	$15/2^-$	1057.55	$13/2^-$			
845.6 *3*	54	5792.4	$35/2^{(+)}$	4946.8	$35/2^{(+)}$			
847.6 *3*	64	10415.6	57/2	9568.0	53/2			
849.8 *4*	21	7214.7	$43/2^{(+)}$	6365.0	$41/2^{(-)}$			
852.9 *2*	254	5904.6	$35/2^-$	5051.7	$31/2^-$	E2	0.00368 *6*	α=0.00368 *6*; α(K)=0.00310 *5*; α(L)=0.000458 *7*; α(M)=9.93×10^{-5} *14*; α(N+..)=2.65×10^{-5} *4* α(N)=2.26×10^{-5} *4*; α(O)=3.53×10^{-6} *5*; α(P)=3.18×10^{-7} *5* B(E2)(W.u.)>37
859.1 *4*	21	5074.8	(31/2)	4215.7	(29/2)			

From ENSDF

$^{143}_{63}Eu_{80}$-7

(HI,xnγ) 1996Pi11 (continued)

γ(^{143}Eu) (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[†]	Comments
866.6 *2*	241	8870.1	51/2$^-$	8003.5	47/2$^-$	E2	0.00356 *5*	α=0.00356 *5*; α(K)=0.00300 *5*; α(L)=0.000441 *7*; α(M)=9.55×10^{-5} *14*; α(N+..)=2.55×10^{-5} *4* α(N)=2.18×10^{-5} *3*; α(O)=3.40×10^{-6} *5*; α(P)=3.07×10^{-7} *5* B(E2)(W.u.)=65 *17*
869.1 *5*	12	4472.9	27/2$^-$	3603.7	23/2$^-$			
877.4 *3*	41	3688.8	25/2$^-$	2811.47	23/2$^+$			
883.8 *2*	194	5051.7	31/2$^-$	4167.9	27/2$^-$	E2	0.00341 *5*	α=0.00341 *5*; α(K)=0.00287 *4*; α(L)=0.000421 *6*; α(M)=9.11×10^{-5} *13*; α(N+..)=2.43×10^{-5} *4* α(N)=2.08×10^{-5} *3*; α(O)=3.25×10^{-6} *5*; α(P)=2.95×10^{-7} *5* B(E2)(W.u.)>2.8
887 *1*		8655.9		7768.9	47/2$^+$			
887.1 *5*	10	7768.9	47/2$^+$	6881.8	43/2$^+$			
897.4 *4*	19	7768.9	47/2$^+$	6871.4	43/2$^+$			
916.4 *2*	614	1305.90	15/2$^-$	389.51	11/2$^-$			
922.3 *4*	12	5869.3	35/2$^{(+)}$	4946.8	35/2$^{(+)}$			
932.1 *4*	36	6871.4	43/2$^+$	5939.3	39/2$^+$			
935.9 *2*	295	6840.5	39/2$^-$	5904.6	35/2$^-$	E2	0.00301 *5*	α=0.00301 *5*; α(K)=0.00254 *4*; α(L)=0.000368 *6*; α(M)=7.96×10^{-5} *12*; α(N+..)=2.13×10^{-5} *3* α(N)=1.82×10^{-5} *3*; α(O)=2.84×10^{-6} *4*; α(P)=2.61×10^{-7} *4* B(E2)(W.u.)>25
940.4 *4*	13	7273.7	41/2$^{(-)}$	6333.2	39/2$^{(+)}$			
942.6 *4*	20	6881.8	43/2$^+$	5939.3	39/2$^+$			
954.4 *2*	92	4318.5	29/2$^+$	3364.1	25/2$^+$	E2	0.00289 *4*	α=0.00289 *4*; α(K)=0.00244 *4*; α(L)=0.000352 *5*; α(M)=7.61×10^{-5} *11*; α(N+..)=2.03×10^{-5} *3* α(N)=1.735×10^{-5} *25*; α(O)=2.72×10^{-6} *4*; α(P)=2.51×10^{-7} *4* B(E2)(W.u.)=2.21 *23*
955.8 *4*	41	12974.4	67/2$^-$	12018.6	63/2$^-$	E2	0.00288 *4*	α=0.00288 *4*; α(K)=0.00243 *4*; α(L)=0.000351 *5*; α(M)=7.58×10^{-5} *11*; α(N+..)=2.02×10^{-5} *3* α(N)=1.729×10^{-5} *25*; α(O)=2.71×10^{-6} *4*; α(P)=2.50×10^{-7} *4* B(E2)(W.u.)=1.1×10^2 *3*
968.7 *3*	40	8972.3	49/2	8003.5	47/2$^-$			
975.0 *3*	47	4318.5	29/2$^+$	3343.4	25/2$^+$	E2	0.00276 *4*	α=0.00276 *4*; α(K)=0.00233 *4*; α(L)=0.000335 *5*; α(M)=7.24×10^{-5} *11*; α(N+..)=1.93×10^{-5} *3* α(N)=1.652×10^{-5} *24*; α(O)=2.59×10^{-6} *4*; α(P)=2.40×10^{-7} *4* B(E2)(W.u.)=1.02 *11*
977.0 *5*	6	7342.1	43/2	6365.0	41/2$^{(-)}$			
995.2 *5*	31	10439.2	(59/2$^-$)	9444.0	(55/2$^-$)			
1012.2 *3*	58	2318.1	19/2$^-$	1305.90	15/2$^-$			
1023.0 *4*	12	2329.03	17/2$^-$	1305.90	15/2$^-$			
1033.0 *3*	31	4397.1	29/2$^+$	3364.1	25/2$^+$			
1037.6 *4*	12	4786.6	31/2$^+$	3748.9	27/2$^+$			
1054.0 *4*	12	4397.1	29/2$^+$	3343.4	25/2$^+$			

From ENSDF

$^{143}_{63}Eu_{80}$-8

(HI,xnγ) 1996Pi11 (continued)

γ(^{143}Eu) (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ	α[†]	Comments
1058.7 *2*	262	2116.27	17/2$^-$	1057.55	13/2$^-$				
1069.0 *4*	25	5722.5	35/2$^{(-)}$	4653.5	33/2$^+$				
1072.2 *2*	237	2378.15	19/2$^-$	1305.90	15/2$^-$				
1076.8 *3*	42	3688.8	25/2$^-$	2611.99	21/2$^-$				
1097.3 *3*	38	11512.9	61/2	10415.6	57/2				
1107.6 *2*	88	9977.7	55/2$^-$	8870.1	51/2$^-$	E2		0.00212 *3*	α=0.00212 *3*; α(K)=0.00180 *3*; α(L)=0.000252 *4*; α(M)=5.43×10^{-5} *8*; α(N+..)=1.495×10^{-5} *21* α(N)=1.241×10^{-5} *18*; α(O)=1.95×10^{-6} *3*; α(P)=1.85×10^{-7} *3*; α(IPF)=4.11×10^{-7} *7* B(E2)(W.u.)>19
1139.0 *3*	21	5792.4	35/2$^{(+)}$	4653.5	33/2$^+$				
1151.6 *2*	174	2457.42	17/2$^+$	1305.90	15/2$^-$	D+Q	−4.2[&] *+4−5*		
1156.5 *4*	15	4167.9	27/2$^-$	3011.5	23/2$^-$				
1184 *1*	7	13036.3		11852.3	(63/2$^-$)				
1185.5 *4*	40	14159.9	71/2$^-$	12974.4	67/2$^-$	E2		0.00185 *3*	α=0.00185 *3*; α(K)=0.001567 *22*; α(L)=0.000218 *3*; α(M)=4.69×10^{-5} *7*; α(N+..)=1.672×10^{-5} *24* α(N)=1.070×10^{-5} *15*; α(O)=1.687×10^{-6} *24*; α(P)=1.615×10^{-7} *23*; α(IPF)=4.17×10^{-6} *7* B(E2)(W.u.)>27
1215.7 *4*	12	5869.3	35/2$^{(+)}$	4653.5	33/2$^+$				
1249.8 *3*	41	11227.4	59/2$^-$	9977.7	55/2$^-$	E2		0.001671 *24*	α=0.001671 *24*; α(K)=0.001412 *20*; α(L)=0.000195 *3*; α(M)=4.19×10^{-5} *6*; α(N+..)=2.33×10^{-5} *4* α(N)=9.56×10^{-6} *14*; α(O)=1.509×10^{-6} *22*; α(P)=1.455×10^{-7} *21*; α(IPF)=1.203×10^{-5} *18* B(E2)(W.u.)>8.7
1271.6 *3*	23	2329.03	17/2$^-$	1057.55	13/2$^-$				
1285.6 *4*	12	3603.7	23/2$^-$	2318.1	19/2$^-$				
1311.7 *5*	18	12824.6	65/2	11512.9	61/2				
1391.1 *5*	13	15551.0	75/2$^-$	14159.9	71/2$^-$				
1394.7 *5*	17	12018.6	63/2$^-$	10624.1	59/2$^-$	E2		0.001380 *20*	α=0.001380 *20*; α(K)=0.001140 *16*; α(L)=0.0001550 *22*; α(M)=3.33×10^{-5} *5*; α(N+..)=5.12×10^{-5} α(N)=7.61×10^{-6} *11*; α(O)=1.203×10^{-6} *17*; α(P)=1.176×10^{-7} *17*; α(IPF)=4.23×10^{-5} *6* B(E2)(W.u.)>2.1
1413.1 *5*	19	11852.3	(63/2$^-$)	10439.2	(59/2$^-$)				
1430.5 *5*	11	15590.4	75/2$^-$	14159.9	71/2$^-$				
1463.6 *5*	7	6709.5	39/2	5245.8	37/2$^{(-)}$				
1469 *1*	10	14293.6		12824.6	65/2				
1504.9 *4*	18	1894.22	15/2$^-$	389.51	11/2$^-$				
1593.8 *4*	12	6975.6	41/2$^{(-)}$	5381.9	37/2$^{(-)}$				
1729.7 *6*	7	6975.6	41/2$^{(-)}$	5245.8	37/2$^{(-)}$				
1801.0 *6*	5	6747.8		4946.8	35/2$^{(+)}$				

From ENSDF

$^{143}_{63}Eu_{80}$-9

(HI,xnγ) 1996Pi11 (continued)

$\gamma(^{143}Eu)$ (continued)

† Additional information 2.
‡ From DCO ratios and intensity balance. Stretched Q are assumed to be E2. A DCO ratio of 1.4 is taken typically to represent a stretched Q or ΔJ=0 for a D transition. A ratio of 0.8 typically represents a stretched D.
# Uncertainty≥5%, larger for weak and complex lines (1996Pi11).
@ Seen only by 1976Wi09.
& From ^{142}Nd(^{6}Li,5nγ) E=65 MeV.

From ENSDF

$^{143}_{63}Eu_{80}$-10

(HI,xnγ) 1996Pi11

Level Scheme

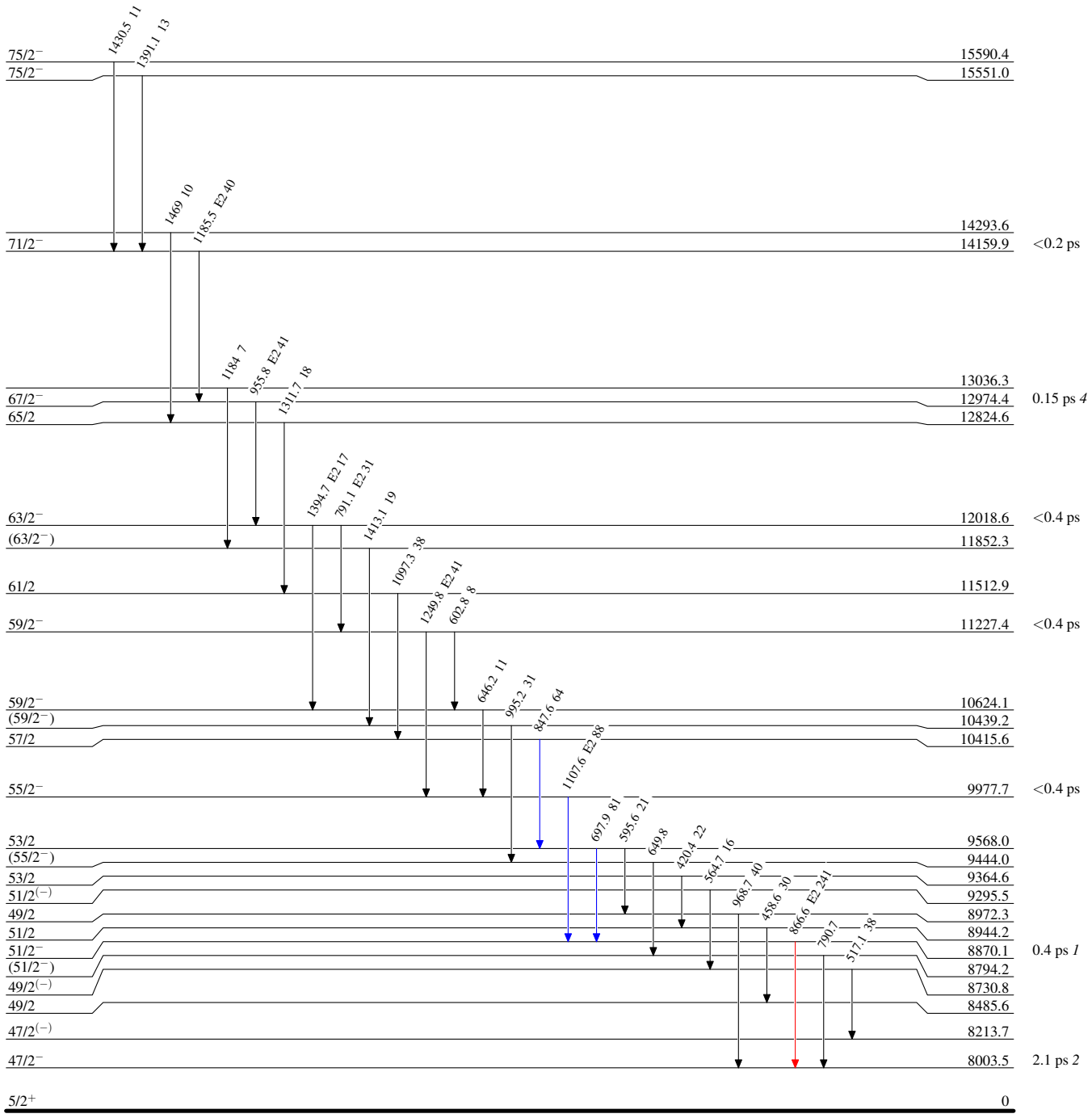
Intensities: Type not specified

Legend

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

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

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



$^{143}_{63}Eu_{80}$

(HI,xnγ) 1996Pi11

Level Scheme (continued)

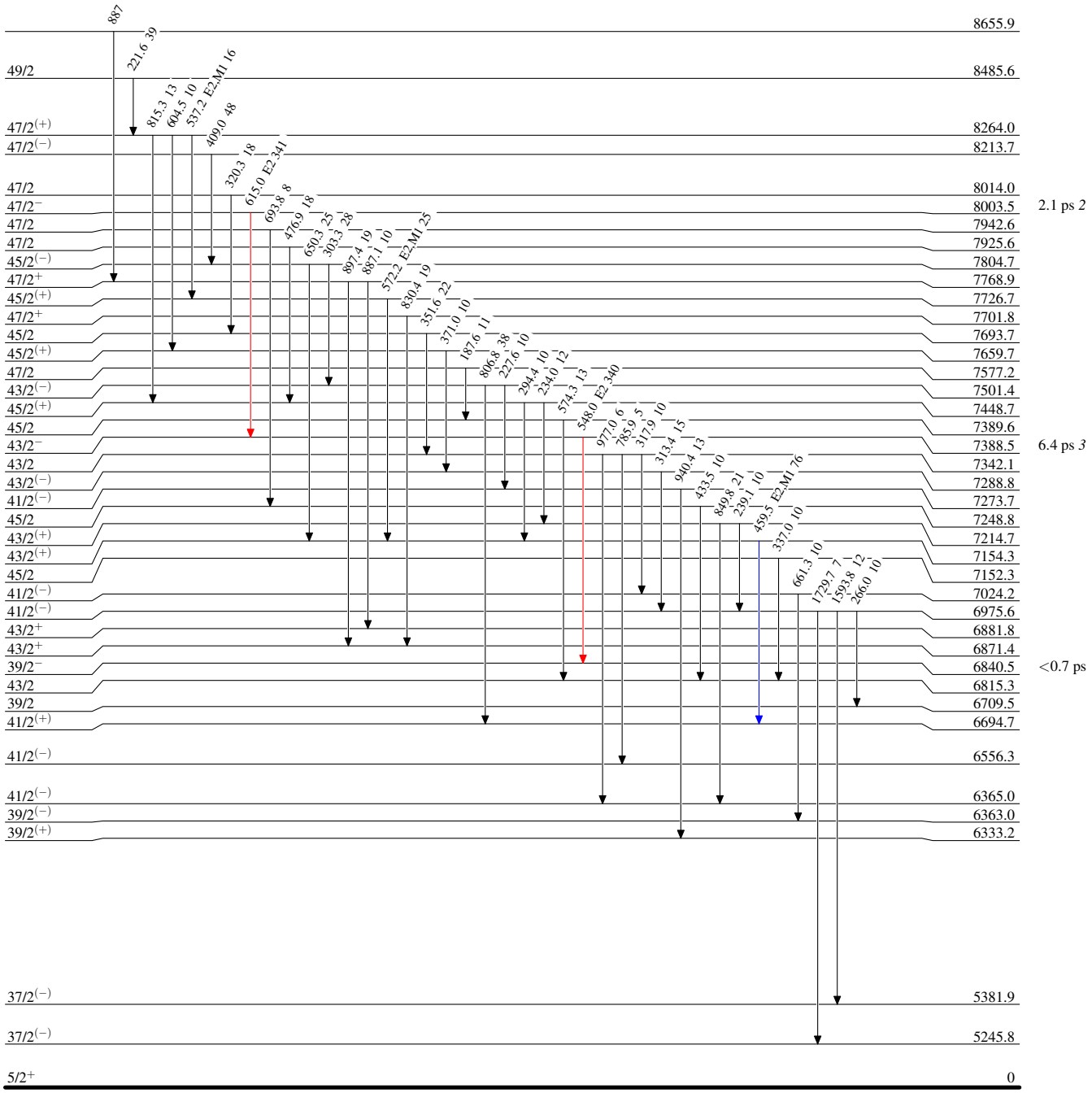
Intensities: Type not specified

Legend

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

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

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

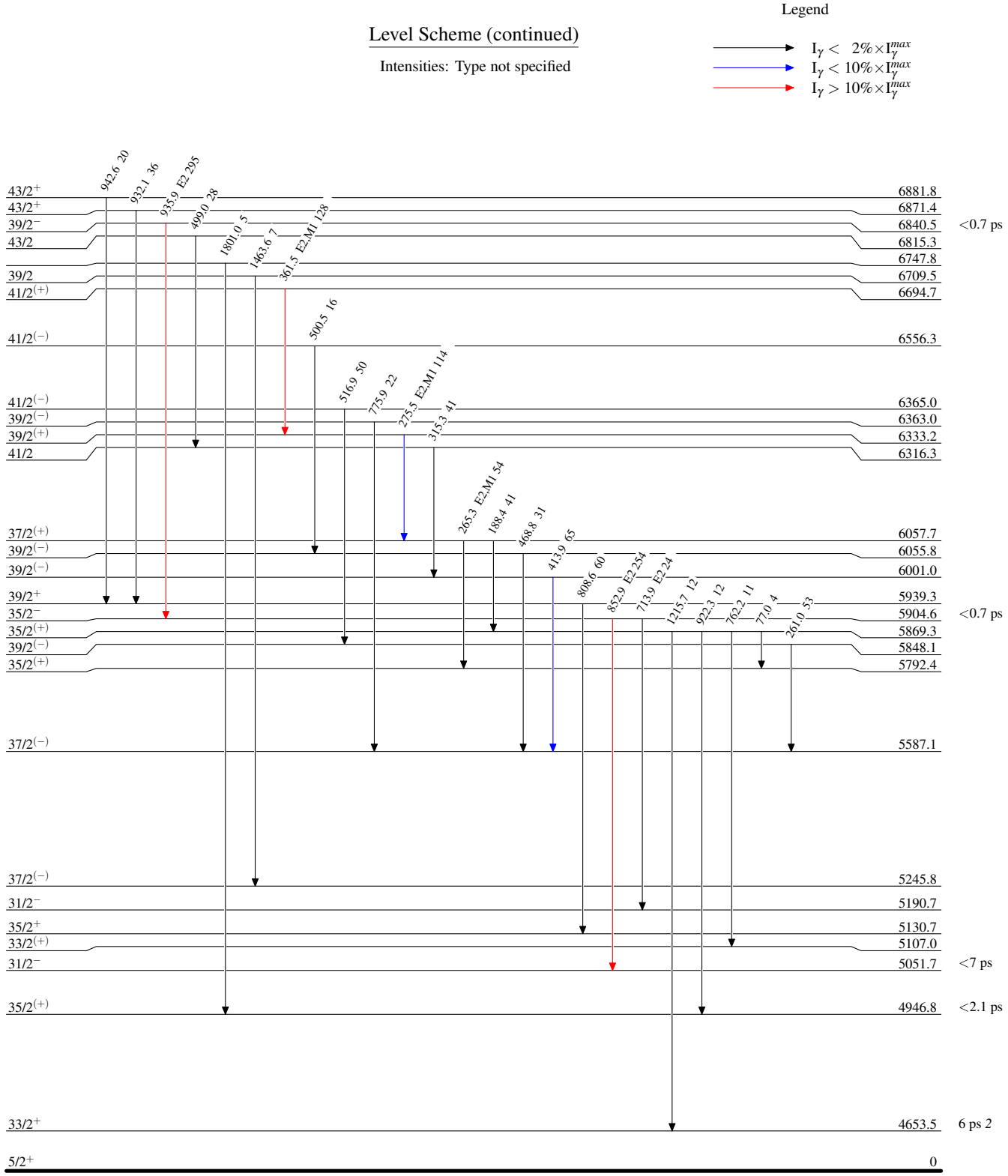


$^{143}_{63}Eu_{80}$

(HI,xnγ) 1996Pi11

Level Scheme (continued)

Intensities: Type not specified

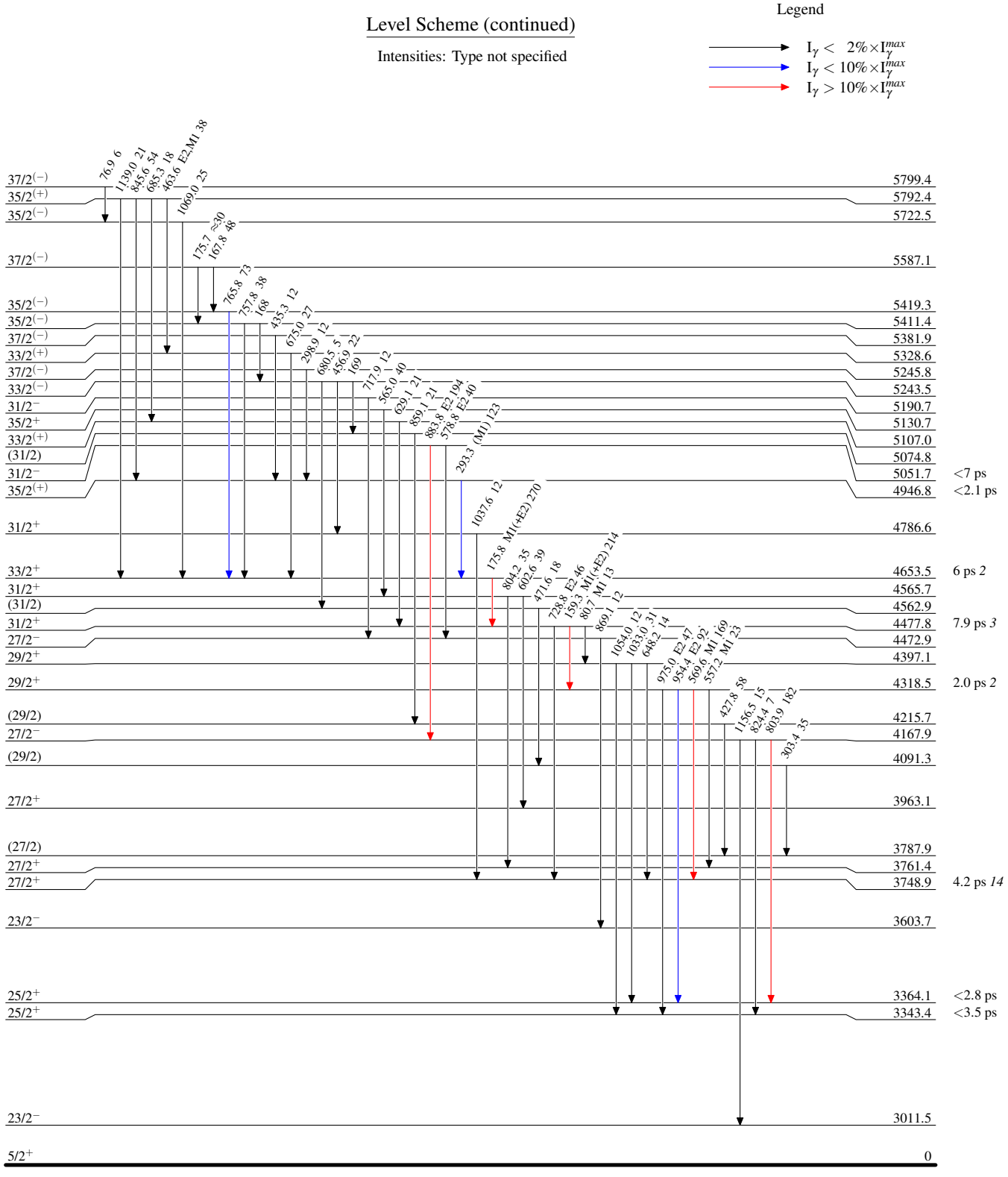


$^{143}_{63}Eu_{80}$

(HI,xnγ) 1996Pi11

Level Scheme (continued)

Intensities: Type not specified

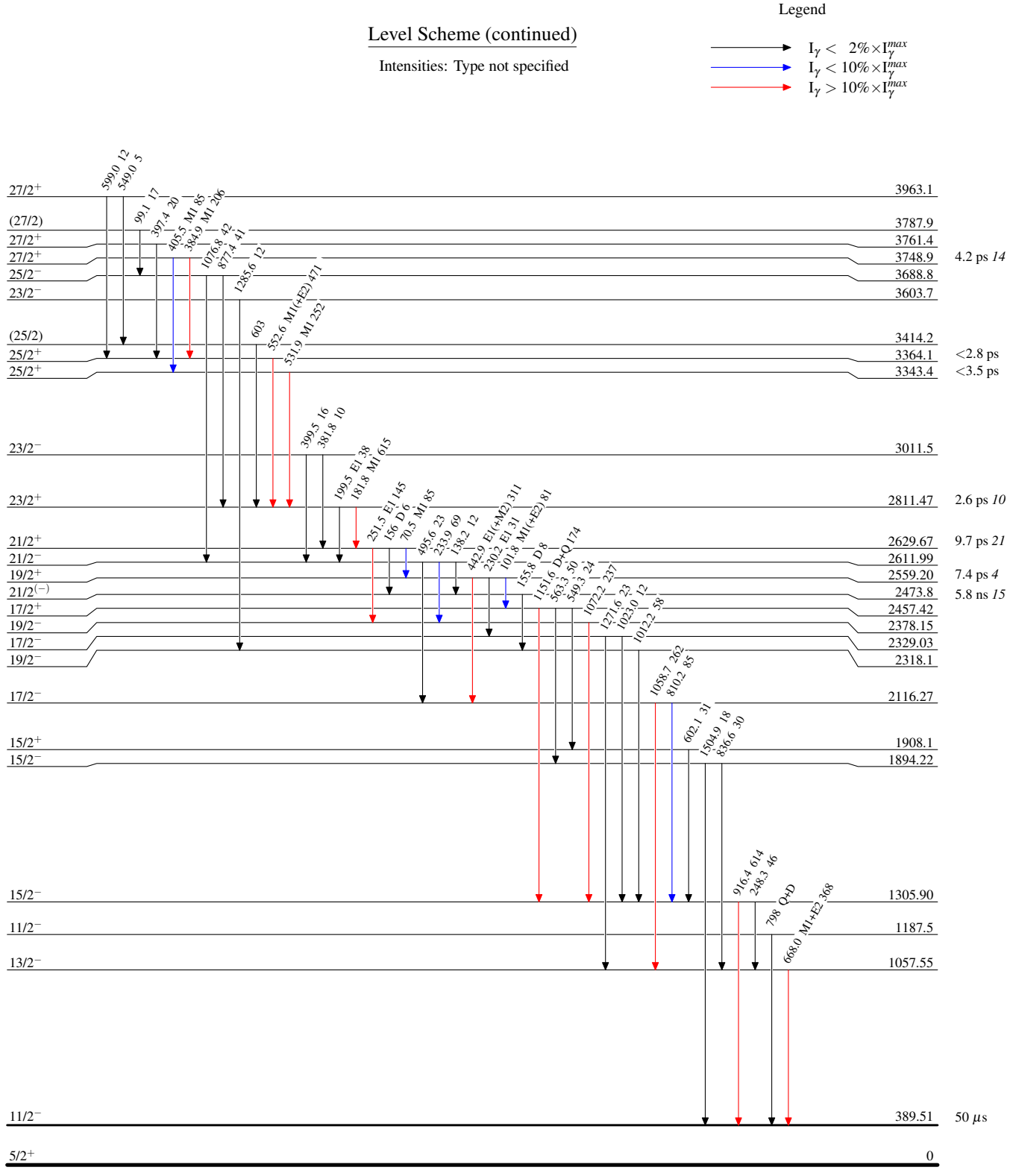


$^{143}_{63}Eu_{80}$

(HI,xnγ) 1996Pi11

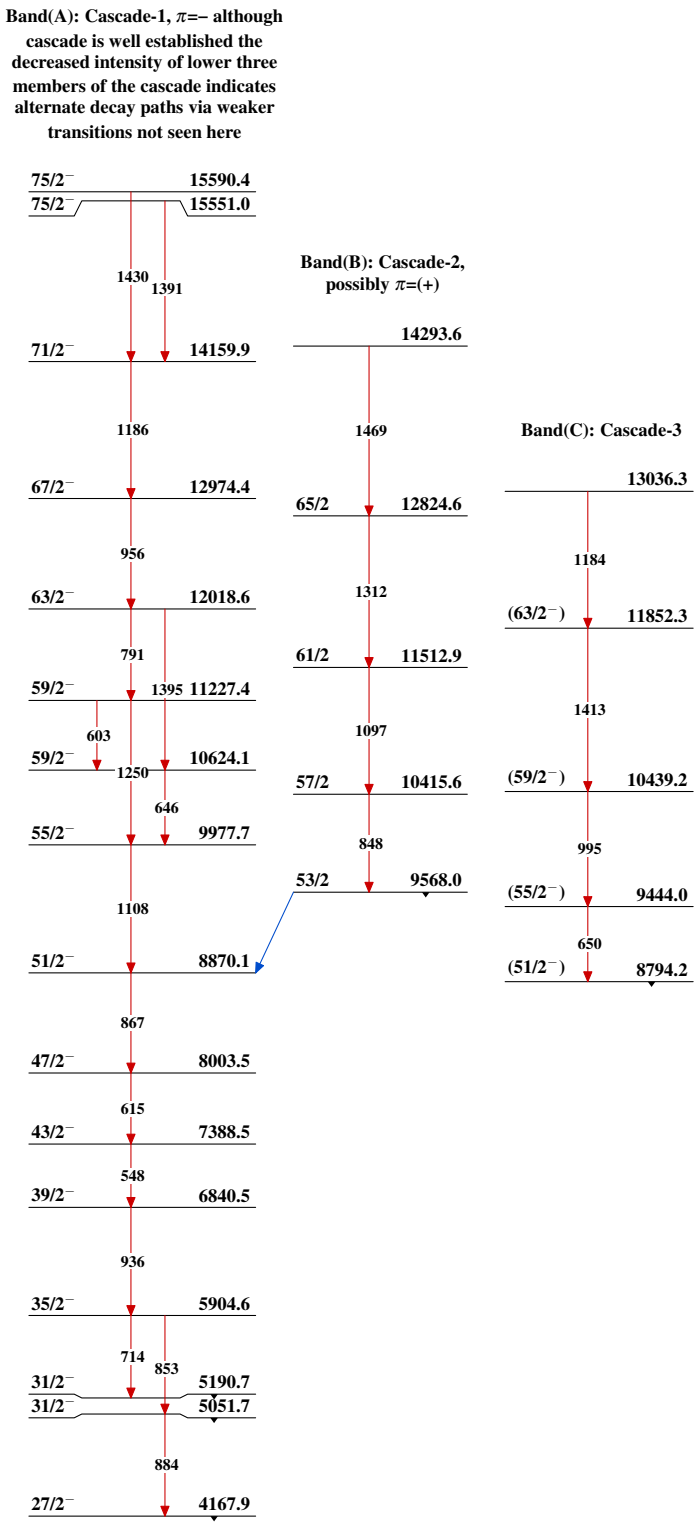
Level Scheme (continued)

Intensities: Type not specified



$^{143}_{63}Eu_{80}$

(HI,xnγ) 1996Pi11



$^{143}_{63}Eu_{80}$