Adopted Levels, Gammas

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

Q(β^-)=1818.7 *7*; S(n)=6306.72 *10*; S(p)=5601.0 *5*; Q(α)=1553 *6* 2017Wa10
Q(ε)=1874.3 *7*; S(2n)=14239 *10*; S(2p)=13869 *5* 2017Wa10
Additional information 1.

^{152}Eu Levels

Calculations:
Coulomb displacement energies and nuclear shapes: 1983Ja07.
Isotope shift, hyperfine structure: 1995We14, 1993HuZU, 1993HuZV, 1986Al33, 1985Ah02.
Levels, octupole correlations: 1993No09.
Rotational bands: signature-dependent properties: 1992Ja03, 1990SeZV, 1985Be15, 1984Be12, 1984Pi09.
Very extended nuclear shape: 1995Ch67.

It has been suggested by 1981Pi07, 1984PrZV and 1989Pe11 that the following levels seen in (p,3nγ) (1984PrZV): 192.5 keV, 7^+, 332.5 keV, (6^-), 358.7 keV, (5^+), 468.8 keV, (6^+) and 488.0 keV, (7^-); and in (^{7}Li,5nγ) (1981Pi07): 211.6 keV, $6^{(-)}$ and 219.5 keV, $7^{(-)}$ have also been seen in (n,γ) E=th, secondary γ's (1978Vo05). However, this evaluator does not feel that the evidence presented for associating the γ's seen by 1978Vo05 in thermal (n,γ) work with the levels seen in the reactions mentioned is conclusive. In general, 1981Pi07 and 1984PrZV have made the association on the basis of equating their measured Eγ with the much more precise measurements of 1978Vo05. However, 1978Vo05 observed >2500 γ's with Eγ<600 keV which makes it in most cases impossible to know which, if any, of the γ's measured by 1978Vo05 are the same as the ones seen by 1981Pi07 and 1984PrZV. In addition, all but one of the proposed levels have J=6 or 7: one would not expect these to be strongly fed from a capturing state with $J^\pi=3^+$. Finally, a number of the γ's associated with these levels by 1981Pi07 and 1984PrZV have been placed elsewhere in the scheme by 1978Vo05.

Cross Reference (XREF) Flags

A	^{152}Eu IT decay (96 min)	E	^{151}Eu(n,γ) E=th: secondary γ's	I	^{153}Eu(p,d), ^{153}Eu(d,t)
B	^{150}Nd(^{7}Li,5nγ)	F	^{151}Eu(n,γ) E=resonance	J	^{154}Sm(p,3nγ)
C	^{151}Sm(^{3}He,d), ^{151}Sm(α,t)	G	^{151}Eu(d,p)	K	^{154}Eu(p,t)
D	^{151}Eu(n,γ) E=th: primary γ's	H	^{152}Eu(p,p')		

E(level)†	J^π	$T_{1/2}$‡	XREF	Comments
0.0[e]	3^-	13.517 y *9*	AB DEF HIJK	%ε+%β^+=72.08 *13*; %β^-=27.92 *13* μ=−1.9401 *8* (1993HuZU,2005St24) Q=+2.71 *3* (1986Al33,2005St24) Configuration:(π,5/2[413])(ν,11/2[505]). μ: Others: −1.9411 *12* (2008Ga03), −1.950 *12* (1986Al33), −1.96 *6* (1985Ah02), −1.9414 *13* (1963Al06,1970He09,1971He18). Q: Others: +2.5 *2* (1985Ah02), Q/Q(^{153}Eu)=1.1822 *5* (1993HuZU). J^π: paramagnetic resonance (1976Fu06); $\beta\gamma(\theta)$; analysis of μ. $T_{1/2}$: Weighted average of 13.533 *11* (1986Wo05), 13.547 *19* (1997Ma75), 13.506 *8* (2010Sc08), and 13.495 *27* (2012Fi12). These references cite work from the National Physical Laboratory in the U.K., Chalk River in Canada, Physikalisch-Technische Bundesanstalt in Germany and the National Institute of Standards and Technology in the U.S., respectively. A value of 13.528 *19* has been recommended by 2004Wo02 and 2007BeZP; however, these evaluations used earlier results from the German and U.S. labs, namely from 2004Sc04 and 2002Un02, respectively. %ε+%β^+,%β^-: from (ΣI(γ+ce) to ^{152}Sm g.s.)+(ΣI(γ+ce) to ^{152}Gd g.s.)=100

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Adopted Levels, Gammas (continued)

^{152}Eu Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
				in the decay of this state. (see ^{152}Eu β^- decay (13 y)). <r^2>$^{1/2}$=5.11 fm 3 (2004An14).
45.5998[d] *4*	0$^-$	9.3116 h *13*	C E	%ε+%β$^+$=27 *3*; %β$^-$=73 *3* Jπ: β$^-$ to 2$^+$ has a first-forbidden unique shape; ε+β$^+$ to 1$^-$. $T_{1/2}$: from 1990Ab06. Others: 9.274 h *3* (1982La25, authors quote 3 σ uncertainty of 0.009 h), 9.30 h *5* (1975Pr05), 9.29 h *2* (1966Co30), 9.35 h *2* (1958Gu09). %ε+%β$^+$,%β$^-$: see ^{152}Eu (9.311 h) decay data sets.
65.2969 *4*	1$^-$	0.94 μs *8*	CDE I	Jπ: M1 γ to 0$^-$ level.
77.2593[f] *4*	3$^-$	38 ns *4*	ABCDEfg i	Jπ: M1+E2 γ to 3$^-$ g.s.; M1 γ from 221.5, 2$^-$ level; γ from 89.8496 *4*+ level.
78.2331[g] *4*	1$^+$	165 ns *10*	Efg i	Jπ: E1 γ to 0$^-$ level.
89.6129[e] *4*	4$^-$		dEf HiJK	Jπ: M1 γ to 3$^-$ g.s.; J=4 from excit (^{7}Li,5nγ); g.s. band member.
89.8496[h] *4*	4$^+$	384 ns *10*	AB dEf iJ	Jπ: E1 γ to 3$^-$ g.s.; J=4 from excit (^{7}Li,5nγ). $T_{1/2}$: other: 0.40 μs *10* from IT decay (96 min).
108.1147[h] *4*	5$^+$[#]	≤20 ns	AB dEF iJ	$T_{1/2}$: From IT decay.
109.0895?[a] *5*	(1)$^-$		dE i	Jπ: M1+E2 γ to 1$^-$ level; multiply placed M1 γ to 0$^-$ level.
111.4473 *4*	2$^-$		C EF I	Jπ: M1 γ to 1$^-$ level; γ's from 201.1, 3$^+$ and 267.6, 4$^-$ levels.
113.9698 *4*	3$^+$		DE G I	Jπ: M1 γ to 4$^+$ level; E1 γ from 221.4542, 2$^-$ level.
118.1661 *4*	2$^-$		DEF I	Jπ: M1 γ to 1$^-$ level; primary γ from 3$^+$ n resonance.
120.8384[g] *4*	2$^+$		E G I	Jπ: M1 γ to 1$^+$ level; γ from 224.5, 3$^-$ level; γ from 214.5, 4$^+$ level.
124.5348 *4*	4$^+$		DEF I	Jπ: M1 γ to 4$^+$ level; γ's from 180.6, 5$^-$ and 220.8, 3$^-$ levels.
141.8259 *4*	4$^-$	2.5 ns *5*	BCDEFG I	Jπ: M1 γ to 3$^-$ level; E1 γ to 4$^+$ level; γ to 5$^+$ level.
146.0857 *4*	3$^+$		EFg i	Jπ: M1 γ's to 3$^+$ and 4$^+$ levels; E2 γ to 1$^+$ level.
147.86[i] *10*	8$^-$[#]	96 min *1*	AB g i	%IT=100 Configuration:(π,5/2[413])(ν,11/2[505]). $T_{1/2}$: from IT decay (96 min).
148.7362[c] *5*	(4)$^+$		E i	Jπ: M1 γ to 5$^+$ level; γ from 374.6-keV (2$^+$,3$^-$) level.
148.76[ch] *3*	6$^+$		B iJ	Jπ: γ's to 4$^+$ and 5$^+$ levels; no γ to J<4; member of rotational band.
150.6870[f] *4*	4$^-$		B DEFG	Jπ: M1+E2 γ to 3$^-$ level; γ to 5$^+$ level; J=4 is confirmed by excit in (^{7}Li,5nγ).
158.0554 *4*	1$^+$	1.8 ns *4*	EF	Jπ: M1 γ to 1$^+$ level; γ to 0$^-$ level.
160.8810 *4*	3$^+$,4$^+$	2.3 ns *4*	DEF I	J M1+E2 γ to 4$^+$ level; γ from 442.9-keV 2$^+$,3$^-$ level.
174.9374 *4*	2$^-$,3$^-$		CDEFG I	Jπ: M1 γ to 2$^-$ level; γ to 4$^-$ level.
177.6865?[a] *8*	(0,1,2,3)$^+$		E	Jπ: M1,E2 γ to 1$^+$ level.
178.9317 *4*	3$^+$,4$^+$		DEFg	Jπ: E1 γ to 3$^-$ level; M1 γ to 4$^+$ level.
180.6328 *4*	5$^-$	2.1 ns *6*	B E g	Jπ: E1 ΔJ=0 γ to 5$^+$. Confirmed by J=5 from excit in (^{7}Li,5nγ).
192.5[h] *7*	7$^+$		IJ	Jπ: γ's to 5$^+$ and 6$^+$ levels; no γ to levels with J<5; member of rotational band.
196.9142 *4*	3$^+$,4$^+$		DE I	Jπ: M1,E2 γ to 5$^+$ level; γ to 3$^-$ level.
199.6648 *4*	4$^+$,5$^+$		EF	Jπ: M1,E2 γ's to 4$^+$ and 5$^+$ levels; γ to 3$^+$ level; fed by primary γ from 3$^+$, but not from 2$^+$ n resonance.
200.7490[be] *9*	5$^-$		E HiJK	Jπ: M1 γ to 4$^-$ level; no γ to J<3; member of g.s. rotational band.
201.1324 *4*	3$^+$		dEF i	Jπ: E1 γ to 3$^-$ level; γ's to 2$^-$, 4$^-$ levels.
203.1119 *5*	1$^-$		dEF i	Jπ: M1 γ to 0$^-$ level.
203.1827 *4*	4$^-$		E i	Jπ: M1,E2 γ to 3$^-$ level; γ's to 3$^+$ and 5$^+$ levels.
211.615 *20*	6		B	Jπ: J=6 from excit (^{7}Li,5nγ).
214.3613?[a] *6*	2$^-$		dEfg i	Jπ: E2 γ to 0$^-$ level.
214.4275 *4*	4$^+$		dEfg i	Jπ: M1 γ's to 4$^+$. E1 γ to 4$^-$. γ to 2$^+$.
219.46 *4*	7		B	Jπ: γ to 6$^+$. J=7 from excit in (^{7}Li,5nγ).
220.7957 *4*	3$^-$		cdEFg i	Jπ: M1 γ's to 4$^-$ and 2$^-$ levels.

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Adopted Levels, Gammas (continued)

^{152}Eu Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[‡]	XREF	Comments
221.2091[j] *6*	3^+		cdE g iJ	Jπ: E1 γ to 3^- g.s.; γ's to 4^- and 4^+ levels; member of rotational band.
221.4542 *4*	2^-		cdE g i	Jπ: E1 γ to 1^+ level; γ to 3^+ level.
224.5007 *4*	3^-		dEF I	Jπ: M1+E2 γ to 2^- level; γ's to 4^+ levels.
227.7206 *5*	3^+		dEFG I	Jπ: M1,E2 γ to 5^+ level; γ to 3^- g.s.; γ from 460.1-keV 2^- level.
234.3 *4*			G	
237.3483 *4*	2^-		dEf i	Jπ: E2,M1 γ to 1^- level; γ's to 3^+ and 1^+ levels.
237.4897 *4*	4^-		dEf i	Jπ: γ's to 2^-, 5^-, 5^+ levels.
246.6554 *5*	3^-,4^-		CDEFG	Jπ: M1 γ to 3^- g.s.; γ's to 4^+ and 2^- levels; doubly placed γ to 2^+ may rule out 4^-.
248.5034 *6*	1^-,2^-		Ef i	Jπ: M1,E2 γ to 0^- level.
249.3309?[a] *8*	1^+		Ef i	Jπ: γ to 0^- level; M1,E2 γ to 1^+ level.
253.7615 *5*	3^+		DEFG I	Jπ: M1+E2 γ to 3^+ level; γ's to 4^- and 1^+ levels.
256.7238 *5*	3^+,4^+		DE	Jπ: M1 γ to 3^+ level; M1,E2 γ to 5^+ level.
258.7824 *5*	4^+,5^+		E	Jπ: M1,E2 γ's to 5^+ and 4^+ levels; γ's to 3^+ and 5^- levels; multiply placed γ to 3^- g.s. may rule out 5^+.
265.7203 *6*	3^-		DEFG I	XREF: D(264.64). Jπ: M1,E2 γ's to 2^- levels; γ's to 2^+ and 4^+ levels.
267.6410 *4*	4^-		C EF I	Jπ: E1 γ to 3^+ level; γ to 5^+ level.
272.3782[b] *5*	2^+		DEFG I	Jπ: γ's to 1^+, 1^- and 4^+ levels.
277.9			G	
278.2[h] *13*	(8^+)		J	Jπ: γ to 7^+ level; member of rotational band.
283.7192 *5*	3^+		DE HI	XREF: D(282.69)H(281). Jπ: γ's to 1^+, 4^+ and 4^- levels.
285.1289 *5*	3^-,4^-		EFGh	Jπ: M1,E2 γ to 4^- level; γ's to 2^- and 5^- levels.
286.0336 *5*	2^-		DE h	Jπ: M1,E2 γ to 3^- level; γ's to 0^-, 1^+ and 4^- levels.
286.47[k] *4*	9^-	3.5 ns *15*	B	Jπ: γ to 7^- is ΔJ=2, E2; no γ to J<7; excit (^{7}Li,5nγ). $T_{1/2}$: from (^{7}Li,5nγ) (1981Pi07).
287.1582[j] *7*	(4^+)		E J	Jπ: member of rotational band; γ's to 3^-, 5^- and 3^+ levels.
294.4522 *5*	3^-,4^-		DEF I	Jπ: M1 γ to 4^- level; γ to 2^- level; γ to questionable $(1)^-$ level at 109.1 keV suggests 3^-.
296.3269 *5*	3^+		C E g	XREF: g(299.5). Jπ: E1 γ to 3^- level; γ's to 2^- and 4^- levels.
301.1896 *5*	3^+,4^+		DEFg I	XREF: g(299.5). Jπ: γ's to 3^+, 5^+ and 2^-,3^- levels; E2,M1 γ to 3^+,4^+ level.
303.4561 *8*	2^+,3^+,4^+		EFg I	XREF: g(304.8). Jπ: E1 γ to 3^- g.s.
306.72[i] *5*	9^-&		B	
307.4595?[a] *9*	2^+,3^+		dE g	XREF: d(308.4)g(304.8). Jπ: M1,E2 γ to 1^+ level; γ to 3^- g.s.; multiply placed γ to 1^- level at 65.3 keV suggests 2^+.
309.3744 *5*	3^-		dEF	XREF: d(308.4). Jπ: M1,E2 γ's to 2^- and 4^- levels; γ to 4^+ level; primary γ from 2^+ resonance.
312.9 *3*			G	
320.9742 *6*	$3^{(+)}$		CDEFg I	XREF: g(322.4). Jπ: γ's to levels with $J^\pi=2^+$, 2^-, 4^+, 4^- limit J to 3; (E1) γ to 3^- gives π=(+).
324.2955 *5*	$(2)^+$		EFg I	XREF: g(322.4). Jπ: E1 γ to 3^- level; γ to 1^- level.
328.1485[b] *8*	2^-		E G	Jπ: M1,E2 γ to 3^- level; γ's to 1^+, 4^- levels.
332.5[e] *10*	6^-		H JK	Jπ: γ to 5^-; no γ to J<5; member of g.s. rotational band.
332.7921 *5*	3^+		dE G I	XREF: d(333.69). Jπ: γ's to 1^+, 4^+ and 4^- levels.
334.3909 *7*	$(4)^-$		dEF	XREF: d(333.69).

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Adopted Levels, Gammas (continued)

^{152}Eu Levels (continued)

E(level)[†]	Jπ	XREF	Comments
			Jπ: E1 γ to 4+ level; γ to 5+ and 3+ levels.
338.3923 *5*	4(−)	C E i	Jπ: γ's to 3+, 3−, 5+ and 5− levels limit J to 4; (M1) γ to 4− level gives π=(−).
339.2177[b] *7*	2	EF i	XREF: F(336.8). Jπ: γ's to 1+, 1−, 3+ and 3− levels limit J to 2.
340.7202[b] *5*	(3−)	DEfg i	XREF: g(340.0). Jπ: γ's to 1− and 4− levels; multiply placed γ's to 4+ and 5− levels suggest 3−.
341.2440 *5*	2−	Efg i	XREF: g(340.0). Jπ: E1 γ to 3+ level; γ to 0− level.
343.3 *16*	2,3,4	F	Jπ: populated only from 3+ (not from 2+) resonances.
345.6396[b] *9*	(1+,2+)	DE I	Jπ: (M1) γ to 1+ level; γ to 3+ level.
347.7468[b] *5*	3+,4	E G	Jπ: γ's to 3+, 3− and 5+ levels; multiply placed (M1,E2) γ to 2− level would rule out 4+, multiply placed γ's to 2+ and 5− levels would rule out 4− and 3+, respectively.
350.2626 *10*	2−,3+	DEF I	Jπ: γ's to 1+ and 4−. Doubly placed (M1,E2) γ to 3+ would give π=+.
353.3462 *6*	3,4−	E	Jπ: γ's to 2−, 4+ and 4− levels; multiply placed (M1) γ to 3+ level would limit Jπ=3+.
358.8 *4*		G	
359.7994 *7*	2−	DEf I	XREF: f(361.4). Jπ: M1,E2 γ to 3− level; γ's to 0−, 3+ levels.
361.6728?[a] *15*	(2,3,4−)	Ef	XREF: f(361.4). Jπ: γ's to 3+ and 3− levels gives Jπ=2,3,4; γ to 1−,2− level rules out 4+; multiply placed γ to 0− would give Jπ=2−.
363.8 *4*		G	
366.4691 *7*	2−,3+	CDE I	Jπ: γ to 4− and 1+ levels; multiply placed γ to 1− level would give Jπ=2−.
368.7[j] *7*	(5+)	J	Jπ: γ's to (4+) and 4− levels; member of rotational band.
374.6091 *9*	(2+,3−)	DE I	Jπ: γ's to 1− and 4+.
375.4[h] *16*	(9+)	J	Jπ: member of rotational band, γ to (8+).
377.4 *4*		D G I	XREF: D(377.5)I(378.8).
383.3 *4*		G	
384.8626 *8*	3−,4−	DEF	Jπ: E1 γ's to 3+ and 4+ levels; γ to the 109.1-keV? (1)− level would rule out Jπ=4−.
387.4583[b] *9*	2+,3+	E g I	Jπ: γ's to 1+ and 4+ levels; multiply placed γ to 65.3-keV 1− level would rule out Jπ=3+.
388.8452?[a] *11*		dE g	XREF: d(390.96). Jπ: γ's to 0− and 5+ indicate that one or more of the transitions May be misplaced.
393.3279[b] *15*	3−	cdEF I	XREF: d(390.96). Jπ: γ's to 2+ and 5− levels give 3−,4+; γ to 203.1119-keV 1−,2− level rules out 4+.
395.9248[b] *18*	3+,4+	cDE I	XREF: D(396.9). Jπ: M1 γ to (3,4)+ level; γ's to 3− and 5+ levels.
399.6752[b] *6*	2,3+	EFG	Jπ: γ's to 1+, 3+, and 3− give Jπ=2,3+. The doubly placed 334 γ to the 1− 65.3 level would eliminate the 3+ alternative.
402.4 *1*		D hI	XREF: D(401.5).
405.4 *4*		Gh	
412.7436 *11*	3+	DEFG I	Jπ: γ's to 1+, 4+ and 4− levels.
417.2 *4*		D F I	XREF: F(415.0)I(416.4).
424.36[k] *5*	10−[@]	B	
430.5 *4*		C G	
434.7380 *11*	4	dE G I	Jπ: γ's to 3+, 3−, 5+ and 5− levels; multiply placed γ to 203.1119-keV 1−,2− level would eliminate 4+.
436.1652[b] *8*	2+,3+	dEF	Jπ: γ's to 1+ and 4+ levels.
440.5049[b] *8*	3,4−	DE G	Jπ: γ's to 4+, 4− and 2− levels; doubly placed γ to 65.3-keV 1− level would rule out 3+ and 4−; doubly placed (M1) γ to 201.1-keV 3+ level would rule out 3− and 4−.
442.8582[b] *22*	2+,3−	EF i	Jπ: γ's to 1− and 4+ levels; E1 γ to the 214.4-keV? 2− level would rule out Jπ=3−.
446.2221 *12*	3,4−	DE G i	XREF: G(444.8). Jπ: γ's to 4+, 4− and 2− levels;

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Adopted Levels, Gammas (continued)

^{152}Eu Levels (continued)

E(level)[†]	Jπ	XREF	Comments
447.79[k] 5	11−[@]	B	
450.8 4		G	
454.92 19		D I	XREF: I(456.5).
460.0672[b] 21	2−	E G I	Jπ: γ's to 0− and 4− levels.
462.5559[b] 8	4	DEF	Jπ: γ's to 3+, 3−, 5+, and 5−.
467.1 4		D	
468.6[j] 13	(6+)	h J	XREF: h(472). Jπ: γ to (5+); member of rotational band.
470.80 14		D FGhI	XREF: h(472).
476.51 21		D G	
482.9469[b] 14		E I	Jπ: γ's to 0− and 4+ levels indicate that one or more γ's may be misassigned.
483.3425?[a] 21	(3)+	E	Jπ: γ's to 4+ and 4− . γ to 1+ is M1 or E2. Consistency with the first argument rules out M1.
485.1 3		D	
488.0[e] 15	7−	H J	Jπ: D γ to 6− level; no γ to J<6; member of g.s. rotational band.
489.62 16		D	
492.0894[b] 11	3−,4−	DEFG I	XREF: D(492.65). Jπ: γ's to 5− and 2− levels.
495.80[i] 7	10−[&]	B	
501.10 13		D I	
508.4783?[a] 12	2+,3+	E	Jπ: γ's to 1+ and 4+ levels.
510.6725[b] 20	3	DEF I	XREF: D(510.24). Jπ: γ's to 2+, 2−, 4+ and 4− levels.
517.9 5		D	
520.8 7		D G	
531		C	
536.77 12		D g	
543.08 14		D g	
550.80 16		D G	
558.9 5		D	
563.26 15		D	
569.05 25		D G	
573.72 18		D	
581.02 13		D	
593.5 6		D G	
599.9 3		D	
611.9 5		A D	
620.9 6		D g	
625.6 6		D g	
625.74[k] 6	12−[@]	B g	
635.4 6		D	
644.4 6		D g	
648.8 6		D g	
658.6 5		D	
673.5 6		D G	
683.0 7		D	
687.5 7		D g	
693.0 6		D g	
711.68[i] 12	11−[&]	B	
711.9 5		CD G	XREF: C(709).
718.3 7		D	
723.8 7		D G	
739.3 6		D	
745.1 10		D	

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Adopted Levels, Gammas (continued)

^{152}Eu Levels (continued)

E(level)[†]	J^π	XREF	Comments
749? *3*		G	
756.4 *5*		D	
758.84[k] *6*	13$^-$[@]	B	
767.8 *5*		D G	
777.6 *6*		D	
787.8 *7*		D	
796.9 *6*		D	
806.4 *5*		D G	
812.5 *7*		D	
822.8 *6*		D G	
843.8 *6*		D	
851.9 *13*		D G	
857.0 *7*		D	
879.1 *6*		D G	
884.6 *5*		D	
893.4 *7*		D	
900.0 *19*		D G	
903.0 *10*		D	
916.9 *6*		D G	
927.5 *5*		D	
941.8 *6*		D G	
950.18[i] *13*	12$^-$[&]	B	
954.03[k] *8*	14$^-$[@]	B	
958 *4*		G	
992 *3*		G	
1206.27[k] *11*	15$^-$[@]	B	J^π: J=15 excit (^{7}Li,5nγ).
1208.47[i] *16*	13$^-$[&]	B	
1406.58[k] *11*	16$^-$[@]	B	
1485.03[i] *24*	14$^-$[&]	B	
1760.42[k] *24*	17$^-$[@]	B	
1775.5[i] *4*	15$^-$[&]	B	
1958.62[k] *24*	18$^-$[@]	B	
2079.7[i] *5*	16$^-$[&]	B	
2401.5[k] *4*	19$^-$[@]	B	J^π: J=19 from excit (^{7}Li,5nγ).
2592.2[k] *4*	20$^-$[@]	B	
6306.71+x		F	E(level): E=neutron separation energy. For x=neutron resonances see ^{151}Eu(n,γ) E=resonance.

[†] From a least squares fit to Eγ where γ's observed; otherwise from the reactions indicated in xref column. Energies from (n,γ) primary gammas include the systematic uncertainties mentioned in that dataset.

[‡] From (n,γ) E=th, secondary γ's, except where noted otherwise.

[#] The 147.86-keV 96 min state decays via an E3-M1 cascade to the 89.85 *4*+ level, with no crossover transitions. This cascade, along with $T_{1/2}$ is consistent only with J^π=8$^-$ and 5$^+$ for the 147.86 and 108 levels, respectively.

[@] Member of rotational band with band structure defined by stretched E2 crossover and ΔJ=1 cascading transitions. In addition, J=15 and J=19 have been determined by excit (^{7}Li,5nγ).

[&] Member of rotational band with band structure defined by crossover and cascading transitions. The mult of the cascading transitions up to the 13$^-$ level have been confirmed as M1+E2.

[a] Level proposed on the basis of secondary γ's from (n,γ) E=th (1978Vo05). However, the existence of the level is not supported by coincidences and could be the result of random combinations (1978Vo05).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{152}Eu Levels (continued)

[b] Level proposed on the basis of secondary γ's from (n,γ) E=th (1978Vo05). The level is not supported by coincidences and is listed as questionable by the authors. However, the existence of the level is supported by the results of other reactions.

[c] It has been suggested that the 148.76-keV 6^+ member of a rotational band seen in (^{7}Li,5nγ) and (p,3nγ) reactions is the same as the 148.7362-keV level seen in (n,γ) E=th; However, there are two problems with this assumption: 1) the proposed level scheme by 1978Vo05 shows several γ's feeding this level from levels which also feed levels with $J^\pi=2^-$ and $1^-,2^-$; 2) there is a serious intensity imbalance at this level if the 148.7362-keV level has $J^\pi=6^+$. The 30.17γ from the 178.9317-keV $(3,4)^+$ level would have mult=E2 or M3; if E2, then α=405 and I(γ+ce)=1540 per 10^4 n captures in (n,γ) E=th, while the intensity out of the 148.7362-keV level is I(γ+ce)(40.6218γ)=294. Therefore, either the 148.7362-keV level proposed by 1978Vo05 from (n,γ) E=th, secondary γ's is not the same as the 6^+ 148.76-keV level seen in (^{7}Li,5nγ) and (p,3nγ) experiments, or the placement of a number of the γ's in the scheme proposed from the (n,γ) E=th secondary γ's is not correct.

[d] Isomeric transition has not been found. 1965Ta03 searched for ce lines in the region of 5-35 keV; upper limit: ≤0.002% for an isomeric transition. 1988BaZK looked for M conversion lines: deduced hindrance factor for the 45.6-keV isomeric transition FW(M3)>3×10^8. 1984Al07 measured isotope shifts for the ^{152}Eu 3^- g.s. and ^{152}Eu 0^- isomer. From this estimate the deformation parameter $\beta\approx+0.25$ for the ^{152}Eu 0^- isomer.

[e] Band(A): Rotational Band − A Configuration=(π 5/2[413])(ν 11/2[505]).

[f] Band(B): Rotational Band − B Configuration=(π 3/2[411])(ν 3/2[521]).

[g] Band(C): Rotational Band − C Configuration=(π 5/2[532])(ν 3/2[532]).

[h] Band(D): Rotational Band − D Configuration=(π 5/2[413])(ν 3/2[402]+3/2[651]).

[i] Band(E): Rotational Band − E Configuration=(π 5/2[413])(ν 11/2[505]).

[j] Band(F): Rotational Band − F Configuration=(π 5/2[532])(ν 11/2[505]).

[k] Band(G): Rotational Band − G Configuration=(π $1h_{11/2}$)(ν $1i_{13/2}$).

Adopted Levels, Gammas (continued)

$\gamma(^{152}Eu)$

All γ data are from $^{151}Eu(n,\gamma)$ E=th: secondary γ's data set, unless otherwise noted.

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α[@]	Comments
65.2969	1^-	19.695 *7*	100 *10*	45.5998	0^-	M1		33.8	B(M1)(W.u.)=7.9×10^{-5} *14*
		65.2965 *5*	26 *3*	0.0	3^-	E2		12.2	B(E2)(W.u.)=0.071 *13*
77.2593	3^-	77.2583 *6*		0.0	3^-	M1+E2	0.10 *3*	3.90 *2*	B(M1)(W.u.)=0.00025 *3*; B(E2)(W.u.)=0.22 *14*
78.2331	1^+	12.965 *15*	10.7 *10*	65.2969	1^-	[E1]		13.6	B(E1)(W.u.)=1.9×10^{-5} *3*
		32.6341 *3*	100 *10*	45.5998	0^-	E1		1.06	B(E1)(W.u.)=1.12×10^{-5} *16*
89.6129	4^-	89.6128 *6*		0.0	3^-	M1		2.53	Mult.: D+Q from (^{7}Li,5nγ).
89.8496	4^+	12.598 *15*	0.41 *4*	77.2593	3^-	[E1]		14.7	B(E1)(W.u.)=8.8×10^{-7} *10*
		89.8492 *7*	100 *7*	0.0	3^-	E1		0.379	B(E1)(W.u.)=5.89×10^{-7} *19* Mult.: from IT decay (96 min); ΔJ=1, D+Q (^{7}Li,5nγ).
108.1147	5^+	18.265 *7*		89.8496	4^+	M1+E2	0.042 *10*	52 *5*	B(M1)(W.u.)≥0.003; B(E2)(W.u.)≥4.9 Mult.,δ: from IT decay (96 min).
109.0895?	$(1)^-$	43.7926 *6*	100 *7*	65.2969	1^-	M1+E2	0.14 *2*	4.3 *4*	
		63.4902[&] *4*	≤159[&]	45.5998	0^-	M1		6.85	
111.4473	2^-	46.1504 *6*	100 *6*	65.2969	1^-	M1		2.71	
		65.8478[&] *9*	≤1.4[&]	45.5998	0^-	[E2]		11.8	
		111.444 *7*	0.14 *5*	0.0	3^-	[M1,E2]		1.50 *15*	
113.9698	3^+	24.110 *10*	100 *10*	89.8496	4^+	M1		18.5	
		113.9694 *12*	0.94 *8*	0.0	3^-	[E1]		0.199	
118.1661	2^-	39.9319 *5*	20.2 *20*	78.2331	1^+	[E1]		0.600	
		52.8693 *4*	100 *17*	65.2969	1^-	M1		11.6	
		72.5663 *7*	3.2 *4*	45.5998	0^-	[E2]		8.07	
		118.1666 *12*	1.83 *19*	0.0	3^-	[M1,E2]		1.24 *9*	
120.8384	2^+	42.6051 *5*	100 *8*	78.2331	1^+	M1		3.43	
		55.5419 *5*	54 *11*	65.2969	1^-	[E1]		1.35	
124.5348	4^+	10.563 *14*	30 *4*	113.9698	3^+	[M1]		215	
		34.6855 *4*	100 *10*	89.8496	4^+	M1		6.30	
141.8259	4^-	33.7100 *7*	1.7 *3*	108.1147	5^+	[E1]		0.965	B(E1)(W.u.)=1.1×10^{-5} *4*
		51.9769 *4*	100 *17*	89.8496	4^+	E1		1.60	B(E1)(W.u.)=0.00018 *+5−3*
		52.2145 *12*	1.0 *4*	89.6129	4^-	[M1,E2]		21 *10*	
		64.5670 *5*	9.6 *12*	77.2593	3^-	M1		6.52	B(M1)(W.u.)=0.00085 *+27−20*
		141.8255 *15*	4.3 *4*	0.0	3^-	[M1,E2]		0.691 *7*	
146.0857	3^+	21.554 *12*	12.6 *12*	124.5348	4^+	(M1)		25.8	
		32.1158 *5*	100 *15*	113.9698	3^+	M1		7.91	
		56.2362 *5*	53 *9*	89.8496	4^+	M1		9.73	
		56.4712 *15*	3.1 *5*	89.6129	4^-	[E1]		1.30	
		67.8516 *5*	13.7 *14*	78.2331	1^+	(E2)		10.5	
		146.0865 *20*	1.8 *3*	0.0	3^-	[E1]		0.102	
147.86	8^-	39.75 *10*		108.1147	5^+	E3		7.49×10^3 *16*	B(E3)(W.u.)=0.000130 *4* E_γ,Mult.: from IT decay (96 min).

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α[@]	Comments
148.7362	$(4)^+$	40.6218 *5*		108.1147	5^+	M1		3.95	
148.76	6^+	≈40.6[†]		108.1147	5^+				
150.6870	4^-	42.5730 *8*	2.2 *3*	108.1147	5^+	[E1]		0.501	
		61.0727 *12*	0.41 *8*	89.6129	4^-	[M1,E2]		12 *4*	
		73.4280 *7*	100 *10*	77.2593	3^-	M1+E2	0.18 *1*	4.59 *1*	
		150.6883 *15*	7.1 *7*	0.0	3^-	M1,E2		0.571 *9*	
158.0554	1^+	37.2171 *12*	17 *3*	120.8384	2^+	[M1]		5.11	B(M1)(W.u.)=0.0057 *+20−15*
		79.8216 *5*	100 *9*	78.2331	1^+	M1		3.53	B(M1)(W.u.)=0.0034 *+10−7*
		92.7575 *6*	51 *4*	65.2969	1^-	[E1]		0.348	B(E1)(W.u.)=1.2×10^{-5} *4*
		112.4557 *8*	63 *4*	45.5998	0^-	(E1)		0.207	B(E1)(W.u.)=8.4×10^{-6} *+26−18*
160.8810	$3^+,4^+$	52.7664 *5*	3.8 *8*	108.1147	5^+	[M1]		11.7	B(M1)(W.u.)=0.00037 *+12−10*
		71.0323 *5*	100 *9*	89.8496	4^+	M1+E2	0.24 *1*	5.15 *2*	B(M1)(W.u.)=0.0038 *+9−6*; B(E2)(W.u.)=23 *+6−4*
		71.2663 *9*	1.18 *11*	89.6129	4^-	[E1]		0.705	B(E1)(W.u.)=5.0×10^{-7} *+12−7*
174.9374	$2^-,3^-$	54.0986 *6*	8.6 *14*	120.8384	2^+	[E1]		1.45	
		56.7715 *5*	100 *14*	118.1661	2^-	M1		9.46	
		60.9669 *8*	5.2 *9*	113.9698	3^+	[E1]		1.06	
		63.4902[&] *4*	≤97[&]	111.4473	2^-	(M1)		6.85	
		65.8478[&a] *9*	≤9.5[&]	109.0895?	$(1)^-$	[M1,E2]		9 *3*	
		85.3257 *30*	1.4 *3*	89.6129	4^-	[M1,E2]		3.6 *7*	
		109.6429 *12*	15.3 *11*	65.2969	1^-	[M1,E2]		1.58 *16*	
177.6865?	$(0,1,2,3)^+$	56.8466 *12*	15 *4*	120.8384	2^+	[M1]		9.43	
		99.4533 *8*	100 *8*	78.2331	1^+	M1,E2		2.2 *3*	
178.9317	$3^+,4^+$	30.17 *4*	24 *8*	148.7362	$(4)^+$	[M1]		9.52	Mult.: this γ cannot be E2 (α(E2)=405) from intensity balance at the 148.7364-keV level.
		32.8457 *5*	18 *3*	146.0857	3^+	[M1]		7.40	
		54.3964 *8*	44 *8*	124.5348	4^+	M1		10.7	
		64.9619 *5*	89 *11*	113.9698	3^+	M1		6.41	
		70.8170[&] *10*	≤4.9[&]	108.1147	5^+	[M1,E2]		6.9 *19*	
		89.0818 *17*	2.4 *3*	89.8496	4^+	[M1,E2]		3.1 *6*	
		89.3182 *15*	2.0 *3*	89.6129	4^-	[E1]		0.385	
		101.6733 *7*	100 *7*	77.2593	3^-	E1		0.271	
		178.928 *3*	10.6 *19*	0.0	3^-	[E1]		0.0590	
180.6328	5^-	29.934 *11*	32 *4*	150.6870	4^-	M1		9.74	B(M1)(W.u.)=0.017 *+7−4*
		31.8962 *5*	7.1 *17*	148.7362	$(4)^+$	[E1]		1.13	B(E1)(W.u.)=3.3×10^{-5} *+16−12*
		38.8068 *5*	23.2 *23*	141.8259	4^-	M1		4.52	B(M1)(W.u.)=0.0056 *+24−15*
		56.0978 *5*	6.9 *12*	124.5348	4^+	[E1]		1.32	B(E1)(W.u.)=5.9×10^{-6} *+26−18*
		72.5190 *6*	100 *9*	108.1147	5^+	E1		0.673	B(E1)(W.u.)=3.9×10^{-5} *+16−10*
		90.7834 *6*	49 *4*	89.8496	4^+	E1		0.368	B(E1)(W.u.)=9.9×10^{-6} *+41−25*
		91.0192 *7*	3.6 *3*	89.6129	4^-	[M1,E2]		2.9 *5*	
		103.3722[&] *10*	≤2.8[&]	77.2593	3^-	[E2]		2.15	
		180.632 *5*	0.55 *16*	0.0	3^-	[E2]		0.303	B(E2)(W.u.)=0.021 *+11−8*
192.5	7^+	43.79[‡]		148.76	6^+				

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
192.5	7^+	84.41[‡]		108.1147	5^+		
196.9142	3^+,4^+	36.0325 *9*	27 *7*	160.8810	3^+,4^+	M1	5.63
		50.8284 *4*	26 *5*	146.0857	3^+	[M1]	13.0
		55.084 *3*	6.5 *14*	141.8259	4^-	[E1]	1.38
		72.3796 *6*	13.5 *14*	124.5348	4^+	[M1,E2]	6.4 *17*
		82.9451 *9*	4.7 *5*	113.9698	3^+	[M1,E2]	4.0 *8*
		88.7982 *6*	100 *6*	108.1147	5^+	M1,E2	3.2 *6*
		107.0642 *10*	41.4 *23*	89.8496	4^+	M1,E2	1.71 *19*
		119.6544 *12*	11.2 *10*	77.2593	3^-	[E1]	0.175
199.6648	4^+,5^+	50.9280 *5*	37 *8*	148.7362	$(4)^+$	[M1]	12.9
		75.1305 *6*	82 *8*	124.5348	4^+	M1,E2	5.6 *14*
		85.6954 *20*	4.0 *6*	113.9698	3^+	[M1,E2]	3.6 *7*
		91.5493 *7*	100 *7*	108.1147	5^+	E2,M1	2.9 *5*
		109.8163 *9*	64 *4*	89.8496	4^+	M1,E2	1.57 *16*
200.7490	5^-	111.1361 *10*	100 *7*	89.6129	4^-	M1	1.36
		200.748 *4*	5.4 *5*	0.0	3^-		
201.1324	3^+	50.4445 *6*	13 *3*	150.6870	4^-		
		55.0469 *5*	78 *13*	146.0857	3^+	M1	10.3
		59.3070 *15*	3.1 *6*	141.8259	4^-		
		76.5958 *20*	3.5 *4*	124.5348	4^+		
		80.2939 *6*	34 *3*	120.8384	2^+		
		82.9659 *15*	4.2 *6*	118.1661	2^-		
		87.1618 *6*	62 *5*	113.9698	3^+	M1,E2	3.4 *6*
		89.6844 *10*	8.1 *12*	111.4473	2^-		
		123.8731 *9*	100 *8*	77.2593	3^-	E1	0.159
		201.132 *3*	27 *3*	0.0	3^-		
203.1119	1^-	45.0579 *10*	5.3 *8*	158.0554	1^+		
		82.2735 *6*	44 *4*	120.8384	2^+		
		84.9454 *6*	14.5 *13*	118.1661	2^-	(M1)	2.95
		137.816 *4*	4.7 *7*	65.2969	1^-		
		157.5135 *12*	100 *9*	45.5998	0^-	M1	0.510
203.1827	4^-	52.4957 *4*	88 *15*	150.6870	4^-		
		78.6486 *6*	68 *7*	124.5348	4^+	(E1)	0.542
		89.2124 *6*	46 *4*	113.9698	3^+		
		95.0670 *6*	86 *7*	108.1147	5^+	(E1)	0.325
		113.3345 *10*	13.5 *11*	89.8496	4^+		
		113.572 *3*	5.3 *6*	89.6129	4^-		
		125.9224 *9*	100 *8*	77.2593	3^-	M1,E2	1.01 *5*
		203.16[#a] *3*	6 *4*	0.0	3^-		
211.615	6	62.86[†] *2*	22.0[†] *24*	148.76	6^+	D,Q[†]	
		103.50[†] *2*	100[†] *10*	108.1147	5^+	D[†]	
214.3613?	2^-	96.1945 *7*	18.0 *14*	118.1661	2^-	M1,E2	2.4 *4*

$^{152}_{63}Eu_{89}$-10

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α[@]
214.3613?	2⁻	149.0637 *12*	27.3 *24*	65.2969	1⁻	M1,E2		0.591 *7*
		168.7608 *12*	100 *8*	45.5998	0⁻	E2		0.382
214.4275	4⁺	53.5460 *6*	7.7 *15*	160.8810	3⁺,4⁺	(M1)		11.2
		63.7388 *9*	5.8 *9*	150.6870	4⁻			
		68.3397[&] *9*	≤4.4[&]	146.0857	3⁺			
		72.6025 *5*	38 *4*	141.8259	4⁻	E1		
		93.5895 *17*	1.03 *15*	120.8384	2⁺	[E2]		3.09
		106.3117 *8*	100 *6*	108.1147	5⁺	M1		1.55
		124.5787 *8*	46 *4*	89.8496	4⁺	M1		0.986
		137.1676 *15*	4.3 *4*	77.2593	3⁻			
219.46	7	70.70[†] *2*		148.76	6⁺	D[†]		
220.7957	3⁻	70.1083 *5*	20.7 *17*	150.6870	4⁻	M1		5.14
		74.7101 *10*	2.2 *3*	146.0857	3⁺			
		78.9702 *6*	8.3 *9*	141.8259	4⁻			
		96.2607 *7*	3.1 *3*	124.5348	4⁺			
		99.9571[#a] *10*	10.0 *15*	120.8384	2⁺			
		102.6292 *7*	39 *3*	118.1661	2⁻	M1		1.71
		109.3490 *8*	100 *6*	111.4473	2⁻	M1,E2		1.59 *16*
		130.9440 *12*	1.85 *17*	89.8496	4⁺			
		143.5360 *12*	11.7 *11*	77.2593	3⁻	M1,E2		0.665 *4*
221.2091	3⁺	96.6734 *10*	0.47 *4*	124.5348	4⁺			
		131.5969 *9*	6.6 *6*	89.6129	4⁻	D[‡]		
		221.2111 *20*	100 *8*	0.0	3⁻	E1		0.0336
221.4542	2⁻	75.3688[&] *6*	8.9[&]	146.0857	3⁺			
		100.6159 *8*	5.0 *4*	120.8384	2⁺			
		103.2866 *7*	13.9 *9*	118.1661	2⁻	(M1)		1.68
		107.4837 *8*	23.0 *14*	113.9698	3⁺	E1		0.233
		110.0074 *12*	1.36 *11*	111.4473	2⁻			
		143.2204 *12*	100 *9*	78.2331	1⁺	E1		0.107
		144.1935 *10*	30 *3*	77.2593	3⁻	M1		0.653
		175.855 *5*	0.89 *15*	45.5998	0⁻			
		221.447 *7*	1.23 *24*	0.0	3⁻			
224.5007	3⁻	73.8126 *7*	18.9 *20*	150.6870	4⁻			
		82.6751 *6*	9.3 *9*	141.8259	4⁻			
		99.9653 *12*	5.6 *11*	124.5348	4⁺			
		103.6619 *8*	6.4 *4*	120.8384	2⁺			
		106.3339 *8*	100 *7*	118.1661	2⁻	M1		1.55
		110.5305 *10*	2.51 *18*	113.9698	3⁺			
		113.0527 *9*	58 *4*	111.4473	2⁻	M1+E2	0.8 *2*	1.40 *4*
		134.6517 *17*	1.62 *16*	89.8496	4⁺			
227.7206	3⁺	66.8396[&] *6*	≤16.2[&]	160.8810	3⁺,4⁺			
		77.0330 *6*	28 *3*	150.6870	4⁻			

$^{152}_{63}Eu_{89}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{152}Eu)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]	Comments
227.7206	3^+	85.8963 *7*	10.9 *9*	141.8259	4^-			
		119.6051 *9*	67 *6*	108.1147	5^+	(E2)	1.27	Mult.: M1,E2 from (n,γ) E=th, secondary γ's, E2 from level scheme.
		137.8710 *10*	100 *9*	89.8496	4^+			
		150.4619[&] *15*	≤10.8[&]	77.2593	3^-			
		227.713 *12*	5.2 *11*	0.0	3^-			
237.3483	2^-	62.4113 *7*	5.7 *8*	174.9374	2^-,3^-			
		79.2937 *5*	23 *3*	158.0554	1^+			
		91.2627 *7*	14.3 *11*	146.0857	3^+			
		119.1819 *12*	1.59 *13*	118.1661	2^-			
		123.3784 *12*	2.8 *3*	113.9698	3^+			
		125.8981 *17*	5.1 *8*	111.4473	2^-			
		159.1152 *20*	3.2 *3*	78.2331	1^+			
		160.0878[&] *15*	≤35[&]	77.2593	3^-	(M1)	0.487	
		172.0517 *12*	100 *8*	65.2969	1^-	E2,M1	0.378 *20*	
237.4897	4^-	56.8566 *6*	100 *17*	180.6328	5^-			
		62.5522 *8*	37 *5*	174.9374	2^-,3^-			
		86.8032 *6*	20.4 *18*	150.6870	4^-			
		91.4036 *8*	10.3 *8*	146.0857	3^+			
		95.6629 *8*	10.0 *8*	141.8259	4^-			
		112.9552 *10*	16.6 *13*	124.5348	4^+			
		119.331 *5*	1.9 *3*	118.1661	2^-			
		123.5186 *9*	77 *6*	113.9698	3^+			
		129.3734 *12*	45 *4*	108.1147	5^+			
		147.634 *8*	2.9 *9*	89.8496	4^+			
		147.887 *12*	2.3 *7*	89.6129	4^-			
		160.2284 *17*	12.8 *12*	77.2593	3^-			
246.6554	3^-,4^-	67.7232 *10*	2.1 *3*	178.9317	3^+,4^+			
		95.970 *5*	0.50 *13*	150.6870	4^-			
		122.118 *3*	0.76 *24*	124.5348	4^+			
		125.8163[&a] *10*	≤15[&]	120.8384	2^+			
		128.4897 *9*	38 *3*	118.1661	2^-	M1,E2	0.95 *4*	
		132.6827 *15*	7.9 *8*	113.9698	3^+			
		135.2075 *10*	73 *7*	111.4473	2^-	M1,E2	0.803 *24*	
		156.806 *3*	1.29 *18*	89.8496	4^+			
		157.0407 *20*	5.5 *5*	89.6129	4^-			
		169.3973 *12*	100 *8*	77.2593	3^-	E2,M1	0.397 *22*	
		246.657 *4*	45 *3*	0.0	3^-	M1	0.149	
248.5034	1^-,2^-	70.8170[&a] *10*	<5.0[&]	177.6865?	$(0,1,2,3)^+$			
		90.4483 *10*	6.0 *5*	158.0554	1^+			
		127.6669 *15*	3.6 *4*	120.8384	2^+			
		130.3377 *10*	39 *4*	118.1661	2^-			

$^{152}_{63}Eu_{89}$-12

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
248.5034	1⁻,2⁻	137.0544 *12*	26 *3*	111.4473	2⁻	(M1,E2)	0.770 *20*
		202.9013 *20*	100 *9*	45.5998	0⁻	M1,E2	0.229 *24*
249.3309?	1⁺	91.2762 *20*	6.1 *9*	158.0554	1⁺		
		131.1647 *10*	39 *4*	118.1661	2⁻		
		171.0949 *15*	100 *9*	78.2331	1⁺	(M1,E2)	0.385 *21*
		184.0338 *20*	28 *3*	65.2969	1⁻		
		203.732 *3*	41 *4*	45.5998	0⁻		
253.7615	3⁺	107.675 *6*	0.48 *14*	146.0857	3⁺		
		111.9351 *12*	7.8 *5*	141.8259	4⁻		
		129.2266 *10*	6.4 *6*	124.5348	4⁺		
		132.9212 *12*	76 *7*	120.8384	2⁺	M1,E2	0.85 *3*
		135.5944 *10*	40 *4*	118.1661	2⁻	(E1)	0.124
		139.7914 *10*	100 *10*	113.9698	3⁺	M1,E2	0.723 *11*
		163.9106 *12*	32.1 *24*	89.8496	4⁺		
		175.529 *4*	1.7 *4*	78.2331	1⁺		
		176.500 *3*	10.7 *10*	77.2593	3⁻		
256.7238	3⁺,4⁺	106.0373 *8*	11.6 *7*	150.6870	4⁻		
		110.6392 *8*	100 *7*	146.0857	3⁺	M1	1.38
		114.8973 *10*	6.4 *5*	141.8259	4⁻		
		132.1888 *12*	8.0 *7*	124.5348	4⁺		
		142.7573 *15*	16.9 *15*	113.9698	3⁺		
		148.6069 *12*	24.5 *23*	108.1147	5⁺	M1,E2	0.596 *7*
		166.8732 *12*	97 *9*	89.8496	4⁺	(M1)	0.434
		167.110[&] *3*	≤3.6[&]	89.6129	4⁻		
		179.465 *3*	14.2 *15*	77.2593	3⁻		
258.7824	4⁺,5⁺	59.1175 *6*	9.1 *14*	199.6648	4⁺,5⁺		
		78.1491 *9*	5.1 *6*	180.6328	5⁻		
		79.8509 *7*	12.5 *13*	178.9317	3⁺,4⁺		
		97.9045 *15*	2.6 *3*	160.8810	3⁺,4⁺		
		108.098 *3*	1.4 *3*	150.6870	4⁻		
		110.0466 *10*	14.4 *10*	148.7362	(4)⁺		
		134.2482 *10*	51 *5*	124.5348	4⁺	M1,E2	0.82 *2*
		144.8096 *20*	3.9 *7*	113.9698	3⁺		
		150.6691 *15*	100 *9*	108.1147	5⁺	M1,E2	0.571 *9*
		168.933 *3*	6.4 *6*	89.8496	4⁺		
		258.818[&] *25*	≤4.6[&]	0.0	3⁻		
265.7203	3⁻	51.303 *7*	6.8 *14*	214.4275	4⁺		
		86.7892 *12*	2.6 *4*	178.9317	3⁺,4⁺		
		115.034 *3*	1.25 *14*	150.6870	4⁻		
		119.6328[&] *12*	≤7.1[&]	146.0857	3⁺		
		123.8952 *12*	5.1 *6*	141.8259	4⁻		
		141.189 *5*	1.4 *3*	124.5348	4⁺		

$^{152}_{63}Eu_{89}$-13

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
265.7203	3⁻	144.8832 *15*	25.0 *21*	120.8384	2⁺		
		147.5558 *12*	54 *5*	118.1661	2⁻	M1,E2	0.610 *5*
		154.2724 *15*	100 *10*	111.4473	2⁻	M1,E2	0.530 *13*
267.6410	4⁻	64.4596 *7*	15.1 *21*	203.1827	4⁻		
		67.9766 *10*	3.1 *5*	199.6648	4⁺,5⁺		
		87.0077 *7*	7.0 *5*	180.6328	5⁻		
		88.7102 *8*	4.1 *3*	178.9317	3⁺,4⁺		
		92.7030 *6*	22.7 *17*	174.9374	2⁻,3⁻		
		106.7617 *10*	9.1 *7*	160.8810	3⁺,4⁺		
		116.9547 *10*	48 *4*	150.6870	4⁻	M1,E2	1.28 *10*
		121.5558 *9*	21.4 *17*	146.0857	3⁺		
		125.8163[&] *10*	≤22.7[&]	141.8259	4⁻		
		149.4726 *17*	12.2 *13*	118.1661	2⁻		
		153.6711 *12*	100 *9*	113.9698	3⁺	E1	0.0887
		156.193 *4*	3.7 *7*	111.4473	2⁻		
		159.5248 *15*	8.2 *7*	108.1147	5⁺		
		177.805 *9*	2.6 *5*	89.8496	4⁺		
		178.026 *3*	4.7 *6*	89.6129	4⁻		
		190.3852 *20*	56 *5*	77.2593	3⁻	M1	0.301
272.3782	2⁺	114.3213 *10*	25.7 *17*	158.0554	1⁺		
		126.294[&] *4*	≤0.9[&]	146.0857	3⁺		
		147.848 *5*	1.30 *22*	124.5348	4⁺		
		158.4069 *12*	34 *3*	113.9698	3⁺	(E2)	0.475
		163.2903[&a] *17*	≤21.7[&]	109.0895?	(1)⁻		
		194.1428 *20*	100 *10*	78.2331	1⁺	M1,E2	0.262 *24*
		207.075 *4*	4.7 *7*	65.2969	1⁻		
278.2	(8⁺)	85.7[‡]		192.5	7⁺		
283.7192	3⁺	59.2201[#a] *9*	1.6 *4*	224.5007	3⁻		
		69.2928 *8*	5.1 *5*	214.4275	4⁺		
		104.7887 *8*	4.8 *3*	178.9317	3⁺,4⁺		
		125.6600 *20*	1.64 *16*	158.0554	1⁺		
		133.0317 *10*	20.8 *19*	150.6870	4⁻		
		137.6336 *15*	13.6 *11*	146.0857	3⁺		
		162.8824 *17*	7.4 *7*	120.8384	2⁺		
		165.553 *3*	2.8 *3*	118.1661	2⁻		
		169.746 *5*	1.6 *3*	113.9698	3⁺		
		172.267 *3*	4.0 *5*	111.4473	2⁻		
		193.873 *3*	9.4 *14*	89.8496	4⁺		
		206.4617 *20*	100 *8*	77.2593	3⁻		
285.1289	3⁻,4⁻	64.3341 *10*	7.1 *8*	220.7957	3⁻		
		83.9964[&] *6*	≤7.9[&]	201.1324	3⁺		
		104.4979 *8*	4.1 *3*	180.6328	5⁻		

$^{152}_{63}Eu_{89}$-14

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]	Comments
285.1289	3⁻,4⁻	134.4392[&] *15*	<3.8[&]	150.6870	4⁻			
		136.378 *8*	0.74 *16*	148.7362	(4)⁺			
		143.3026 *15*	10.3 *11*	141.8259	4⁻			
		166.961 *3*	2.16 *21*	118.1661	2⁻			
		171.158 *3*	1.9 *3*	113.9698	3⁺			
		195.520 *3*	17.9 *16*	89.6129	4⁻	M1,E2	0.256 *24*	
		207.870 *4*	4.4 *5*	77.2593	3⁻			
		285.132 *4*	100 *7*	0.0	3⁻	(M1,E2)	0.084 *17*	
286.0336	2⁻	71.6718 *6*	22.1 *22*	214.3613?	2⁻	M1,E2	6.6 *19*	
		82.9223 *9*	4.9 *5*	203.1119	1⁻			
		84.9009 *12*	2.12 *22*	201.1324	3⁺			
		108.346[a] *5*	1.0 *3*	177.6865?	(0,1,2,3)⁺			
		127.9781 *10*	25.1 *22*	158.0554	1⁺			
		139.9487 *15*	7.4 *7*	146.0857	3⁺			
		165.1919 *20*	5.8 *5*	120.8384	2⁺			
		167.867 *4*	1.7 *3*	118.1661	2⁻			
		196.419 *4*	38 *4*	89.6129	4⁻			
		207.7987 *20*	48 *4*	78.2331	1⁺			
		208.7722 *20*	100 *9*	77.2593	3⁻	M1,E2	0.210 *24*	
		240.415 *17*	3.4 *9*	45.5998	0⁻			
286.47	9⁻	67.01[†] *2*		219.46	7	E2[†]	11.0	B(E2)(W.u.)=2.1×10² *9*
287.1582	(4⁺)	65.9486 *5*	69 *7*	221.2091	3⁺			
		86.4076 *15*	4.2 *4*	200.7490	5⁻			
		197.313[&] *4*	≤8.0[&]	89.8496	4⁺			
		197.551 *3*	63 *6*	89.6129	4⁻			
		287.159 *7*	100 *9*	0.0	3⁻			
294.4522	3⁻,4⁻	69.9532 *10*	6.5 *8*	224.5007	3⁻			
		72.9974 *8*	7.3 *11*	221.4542	2⁻			
		73.6575 *6*	87 *9*	220.7957	3⁻	(M1)	4.45	
		91.3366 *20*	11.2 *9*	203.1119	1⁻			
		113.8212 *9*	100 *7*	180.6328	5⁻			
		115.5183 *12*	5.7 *5*	178.9317	3⁺,4⁺			
		133.5738 *15*	8.7 *9*	160.8810	3⁺,4⁺			
		143.7655 *12*	49 *4*	150.6870	4⁻	M1	0.658	
		148.3636 *17*	12.9 *13*	146.0857	3⁺			
		152.6257 *15*	10.2 *10*	141.8259	4⁻			
		169.917 *5*	4.4 *7*	124.5348	4⁺			
		176.288 *3*	14.2 *12*	118.1661	2⁻			
		183.005 *3*	6.0 *9*	111.4473	2⁻			
		185.357[a] *9*	3.7 *7*	109.0895?	(1)⁻			
		204.848 *15*	4.6 *19*	89.6129	4⁻			
		217.197 *4*	20.1 *21*	77.2593	3⁻			

$^{152}_{63}Eu_{89}$-15

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α[@]
296.3269	3+	81.8997 *12*	2.3 *4*	214.4275	4+			
		95.1946 *6*	62 *5*	201.1324	3+	M1		2.13
		99.4145 *9*	5.8 *9*	196.9142	3+,4+			
		117.3976 *8*	82 *7*	178.9317	3+,4+	M1		1.17
		135.4468 *20*	2.0 *3*	160.8810	3+,4+			
		145.6383 *20*	2.9 *3*	150.6870	4−			
		171.7901 *15*	63 *6*	124.5348	4+	M1,E2		0.380 *21*
		175.487 *3*	5.7 *7*	120.8384	2+			
		178.1596 *20*	17.9 *20*	118.1661	2−			
		182.3587 *17*	100 *9*	113.9698	3+	M1		0.339
		219.0699 *20*	91 *7*	77.2593	3−	E1		0.0344
301.1896	3+,4+	86.761 *4*	1.5 *6*	214.4275	4+			
		100.0584 *7*	9.5 *8*	201.1324	3+			
		104.2777 *12*	4.1 *3*	196.9142	3+,4+			
		122.2568 *9*	24.3 *18*	178.9317	3+,4+	E2,M1		1.11 *7*
		126.2513 *15*	3.0 *3*	174.9374	2−,3−			
		140.3094 *10*	100 *9*	160.8810	3+,4+	M1,E2		0.715 *14*
		150.5042 *20*	2.21 *22*	150.6870	4−			
		155.1024 *15*	21.7 *18*	146.0857	3+			
		159.3609 *20*	4.8 *5*	141.8259	4−			
		176.661 *3*	1.7 *3*	124.5348	4+			
		187.222 *3*	13.7 *14*	113.9698	3+			
		193.077 *4*	56 *11*	108.1147	5+			
		211.341 *25*	2.2 *11*	89.8496	4+			
		301.174[&] *15*	≤6.2[&]	0.0	3−			
303.4561	2+,3+,4+	82.2465 *5*	71 *7*	221.2091	3+	(M1)		3.24
		102.325 *3*	3.4 *6*	201.1324	3+			
		303.465 *8*	100 *9*	0.0	3−	E1		0.0149
306.72	9−	158.86[†] *5*		147.86	8−	M1+E2[†]	−0.30[†] *+9−14*	0.495 *8*
307.4595?	2+,3+	50.7355 *10*	15 *3*	256.7238	3+,4+			
		149.402 *3*	5.5 *9*	158.0554	1+			
		182.921 *9*	2.0 *4*	124.5348	4+			
		186.6223 *17*	100 *9*	120.8384	2+	(M1,E2)		0.295 *24*
		193.482 *4*	5.5 *8*	113.9698	3+			
		198.364[&a] *12*	≤5.5[&]	109.0895?	(1)−			
		229.225 *3*	83 *8*	78.2331	1+	M1,E2		0.159 *23*
		242.155[&] *12*	≤5.3[&]	65.2969	1−			
		307.469 *10*	16 *3*	0.0	3−			
309.3744	3−	52.6485 *12*	3.1 *12*	256.7238	3+,4+			
		87.9210 *7*	8.9 *6*	221.4542	2−			
		94.942 *3*	1.3 *3*	214.4275	4+			
		106.1906 *10*	8.9 *6*	203.1827	4−			

$^{152}_{63}Eu_{89}$-16

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
309.3744	3⁻	108.238 *3*	2.13 *22*	201.1324	3⁺		
		130.4449 *12*	4.8 *5*	178.9317	3⁺,4⁺		
		134.4392[&] *15*	≤8.2[&]	174.9374	2⁻,3⁻		
		158.6873 *15*	51 *4*	150.6870	4⁻	M1,E2	0.486 *15*
		163.2903[&] *17*	≤28[&]	146.0857	3⁺		
		167.5480 *15*	29.8 *22*	141.8259	4⁻		
		191.210 *3*	11.0 *11*	118.1661	2⁻		
		197.9292 *17*	100 *9*	111.4473	2⁻	M1,E2	0.247 *25*
		219.518 *8*	4.2 *8*	89.8496	4⁺		
320.9742	3(+)	74.320 *3*	2.0 *4*	246.6554	3⁻,4⁻		
		83.4853 *10*	2.1 *3*	237.4897	4⁻		
		96.4750 *12*	3.2 *8*	224.5007	3⁻		
		99.5186 *20*	1.35 *16*	221.4542	2⁻		
		106.5460 *9*	9.2 *7*	214.4275	4⁺		
		119.8421 *12*	5.7 *5*	201.1324	3⁺		
		124.063 *3*	3.0 *4*	196.9142	3⁺,4⁺		
		146.038 *3*	1.8 *3*	174.9374	2⁻,3⁻		
		170.2828 *20*	32 *3*	150.6870	4⁻		
		174.888 *4*	2.0 *3*	146.0857	3⁺		
		179.153 *5*	1.9 *4*	141.8259	4⁻		
		200.134 *4*	11.1 *12*	120.8384	2⁺		
		202.810 *3*	13.9 *12*	118.1661	2⁻		
		207.004 *3*	28.7 *25*	113.9698	3⁺		
		231.332 *20*	1.4 *6*	89.6129	4⁻		
		243.714 *3*	100 *7*	77.2593	3⁻	(E1)	0.0261
		320.943 *15*	5.7 *12*	0.0	3⁻		
324.2955	(2)⁺	86.9483 *10*	1.43 *12*	237.3483	2⁻		
		102.8412 *8*	5.1 *4*	221.4542	2⁻		
		103.5007 *7*	100 *8*	220.7957	3⁻	E1	0.259
		109.9360[a] *12*	1.00 *10*	214.3613?	2⁻		
		121.1837 *10*	2.14 *20*	203.1119	1⁻		
		123.1628 *12*	1.49 *18*	201.1324	3⁺		
		146.6080[a] *15*	3.8 *3*	177.6865?	(0,1,2,3)⁺		
		166.2401 *20*	6.5 *6*	158.0554	1⁺		
		203.457 *3*	8.0 *8*	120.8384	2⁺		
		206.1303 *20*	33 *3*	118.1661	2⁻		
		212.844 *3*	5.3 *6*	111.4473	2⁻		
		215.210[a] *3*	10.6 *10*	109.0895?	(1)⁻		
		247.039 *3*	25.5 *18*	77.2593	3⁻		
		258.998 *15*	2.0 *6*	65.2969	1⁻		
328.1485	2⁻	107.3527 *8*	100 *6*	220.7957	3⁻	M1,E2	1.69 *19*
		150.4619[&a] *15*	≤12.8[&]	177.6865?	(0,1,2,3)⁺		

$^{152}_{63}Eu_{89}$-17

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
328.1485	2⁻	153.214 *5*	3.4 *6*	174.9374	2⁻,3⁻		
		186.325 *4*	19.3 *25*	141.8259	4⁻		
		209.987 *5*	8.1 *13*	118.1661	2⁻		
		249.921 *4*	39 *3*	78.2331	1⁺		
		262.857 *7*	33 *4*	65.2969	1⁻		
332.5	6⁻	131.8[‡]		200.7490	5⁻		
332.7921	3⁺	46.758 *5*	48 *8*	286.0336	2⁻		
		65.1512 *8*	6.7 *10*	267.6410	4⁻		
		86.1374 *9*	4.4 *4*	246.6554	3⁻,4⁻		
		95.446 *3*	2.2 *3*	237.3483	2⁻		
		108.2918[&] *10*	≤8.6[&]	224.5007	3⁻		
		111.3384 *9*	15.2 *10*	221.4542	2⁻		
		118.359 *3*	2.8 *8*	214.4275	4⁺		
		129.6105 *12*	6.4 *6*	203.1827	4⁻		
		131.6628 *17*	3.9 *7*	201.1324	3⁺		
		135.8786 *20*	3.9 *5*	196.9142	3⁺,4⁺		
		157.853 *3*	3.9 *5*	174.9374	2⁻,3⁻		
		182.1050 *20*	33 *3*	150.6870	4⁻		
		190.9650 *20*	52 *6*	141.8259	4⁻		
		214.625 *3*	100 *9*	118.1661	2⁻		
		218.824 *9*	4.0 *8*	113.9698	3⁺		
		221.349 *15*	6.0 *22*	111.4473	2⁻		
		243.164 *20*	4.5 *12*	89.6129	4⁻		
		254.563 *5*	8.0 *7*	78.2331	1⁺		
		255.531 *4*	32.8 *22*	77.2593	3⁻		
334.3909	(4)⁻	87.7342 *10*	3.0 *3*	246.6554	3⁻,4⁻		
		106.6709 *20*	1.74 *15*	227.7206	3⁺		
		113.5969 *17*	2.22 *21*	220.7957	3⁻		
		134.7280 *15*	2.8 *3*	199.6648	4⁺,5⁺		
		137.4780 *12*	3.6 *3*	196.9142	3⁺,4⁺		
		159.456[&] *8*	≤0.93[&]	174.9374	2⁻,3⁻		
		183.705 *4*	9.0 *15*	150.6870	4⁻		
		192.563 *3*	15.0 *15*	141.8259	4⁻		
		209.856 *3*	18.0 *15*	124.5348	4⁺		
		226.254 *15*	2.7 *5*	108.1147	5⁺		
		244.547 *3*	100 *7*	89.8496	4⁺	E1	0.0258
		334.373[&] *10*	≤13.8[&]	0.0	3⁻		
338.3923	4(−)	117.1836 *12*	5.7 *5*	221.2091	3⁺		
		117.599 *3*	4.0 *8*	220.7957	3⁻		
		123.9630 *10*	13.2 *12*	214.4275	4⁺		
		141.4776 *12*	21.6 *19*	196.9142	3⁺,4⁺		
		157.7608 *15*	24.2 *22*	180.6328	5⁻		

$^{152}_{63}Eu_{89}$-18

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
338.3923	4(−)	159.456[&] *8*	≤3.0[&]	178.9317	3+,4+		
		163.448 *6*	4.8 *9*	174.9374	2−,3−		
		177.504 *4*	3.2 *6*	160.8810	3+,4+		
		187.709 *3*	100 *10*	150.6870	4−	(M1)	0.313
		196.565[&] *3*	≤28[&]	141.8259	4−		
		213.867 *4*	21.0 *21*	124.5348	4+		
		226.91[&] *3*	≤4.4[&]	111.4473	2−		
		230.267 *4*	25.4 *23*	108.1147	5+		
		248.775 *5*	30 *3*	89.6129	4−		
		261.142 *6*	25 *4*	77.2593	3−		
339.2177	2	66.8396[&] *6*	≤32[&]	272.3782	2+		
		114.7144 *15*	10.8 *17*	224.5007	3−		
		117.773 *4*	3.8 *7*	221.4542	2−		
		136.1045 *15*	9.0 *8*	203.1119	1−		
		161.528 *7*	3.9 *7*	177.6865?	(0,1,2,3)+		
		164.247[#a] *20*	3.2 *13*	174.9374	2−,3−		
		181.165 *3*	69 *7*	158.0554	1+		
		193.143 *8*	5.6 *22*	146.0857	3+		
		218.377 *3*	66 *6*	120.8384	2+		
		221.060 *5*	44 *7*	118.1661	2−		
		260.991 *17*	12.3 *24*	78.2331	1+		
		273.925 *6*	100 *10*	65.2969	1−		
		339.213[&] *25*	≤18[&]	0.0	3−		
340.7202	(3−)	68.3397[&] *9*	≤21[&]	272.3782	2+		
		83.9964[&] *6*	≤54[&]	256.7238	3+,4+		
		103.2314 *17*	15.5 *23*	237.4897	4−		
		103.3722[&] *10*	≤38[&]	237.3483	2−		
		119.2658 *10*	27.5 *21*	221.4542	2−		
		126.294[&] *4*	≤3.8[&]	214.4275	4+		
		137.5367 *12*	34 *3*	203.1827	4−		
		160.0878[&] *15*	≤236[&]	180.6328	5−	(E2)	
		161.786 *6*	9 *3*	178.9317	3+,4+		
		190.038 *3*	57 *5*	150.6870	4−		
		194.634 *3*	25.4 *25*	146.0857	3+		
		198.898 *3*	73 *7*	141.8259	4−		
		222.552 *3*	100 *9*	118.1661	2−		
		226.746 *4*	73 *7*	113.9698	3+		
		229.273 *5*	63 *9*	111.4473	2−		
		231.614[&a] *5*	≤26[&]	109.0895?	(1)−		
		251.103 *17*	16 *3*	89.6129	4−		

$^{152}_{63}Eu_{89}$-19

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
340.7202	(3$^-$)	263.470 *10*	26 *4*	77.2593	3$^-$		
		275.425 *15*	22 *4*	65.2969	1$^-$		
		340.66 *3*	30 *5*	0.0	3$^-$		
341.2440	2$^-$	75.5243 *15*	2.6 *3*	265.7203	3$^-$		
		94.5887 *6*	17.9 *16*	246.6554	3$^-$,4$^-$		
		119.7894 *10*	10.7 *9*	221.4542	2$^-$		
		120.4467 *10*	5.1 *5*	220.7957	3$^-$		
		126.878[a] *3*	2.6 *3*	214.3613?	2$^-$		
		140.1134 *10*	40 *4*	201.1324	3$^+$		
		166.3072 *20*	12.7 *11*	174.9374	2$^-$,3$^-$		
		190.549 *5*	4.1 *6*	150.6870	4$^-$		
		220.404 *3*	35 *3*	120.8384	2$^+$		
		223.073 *3*	45 *4*	118.1661	2$^-$		
		227.276 *3*	100 *8*	113.9698	3$^+$	E1	0.0313
		229.794 *5*	8.0 *8*	111.4473	2$^-$		
		263.022 *10*	12.5 *22*	78.2331	1$^+$		
		263.971 *8*	18 *3*	77.2593	3$^-$		
		275.952 *4*	77 *5*	65.2969	1$^-$		
		295.660 *12*	7.6 *16*	45.5998	0$^-$		
345.6396	(1$^+$,2$^+$)	108.2918[&] *10*	≤15.3[&]	237.3483	2$^-$		
		131.2732[a] *15*	5.3 *6*	214.3613?	2$^-$		
		187.5833 *20*	73 *8*	158.0554	1$^+$	(M1)	0.314
		224.802 *4*	100 *9*	120.8384	2$^+$		
		227.475 *8*	10 *3*	118.1661	2$^-$		
		231.666 *4*	35 *3*	113.9698	3$^+$		
		267.403 *6*	69 *4*	78.2331	1$^+$		
347.7468	3$^+$,4	51.4202 *10*	7.4 *19*	296.3269	3$^+$		
		75.3688[&] *6*	≤56[&]	272.3782	2$^+$		
		88.9629 *12*	3.6 *3*	258.7824	4$^+$,5$^+$		
		110.255 *6*	2.7 *5*	237.4897	4$^-$		
		126.294[&] *4*	≤1.8[&]	221.4542	2$^-$		
		133.3181 *12*	11.2 *11*	214.4275	4$^+$		
		148.0816 *20*	18.2 *18*	199.6648	4$^+$,5$^+$		
		150.8340 *17*	38 *3*	196.9142	3$^+$,4$^+$		
		167.110[&] *3*	≤8.1[&]	180.6328	5$^-$		
		168.809 *4*	10.7 *21*	178.9317	3$^+$,4$^+$		
		172.810 *3*	6.4 *8*	174.9374	2$^-$,3$^-$		
		186.8670 *20*	100 *9*	160.8810	3$^+$,4$^+$		
		197.062 *3*	15.5 *19*	150.6870	4$^-$		
		201.665 *10*	3.8 *8*	146.0857	3$^+$		
		223.212 *4*	32 *3*	124.5348	4$^+$		
		226.91[&] *3*	≤3.9[&]	120.8384	2$^+$		

$^{152}_{63}Eu_{89}$-20

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
347.7468	3$^+$,4	233.780 *4*	53 *4*	113.9698	3$^+$		
		236.292[&] *4*	≤59[&]	111.4473	2$^-$	(M1,E2)	0.146 *22*
		239.631 *4*	61 *4*	108.1147	5$^+$		
		270.483 *9*	20.0 *16*	77.2593	3$^-$		
350.2626	2$^-$,3$^+$	96.495 *3*	3.2 *6*	253.7615	3$^+$		
		129.4706 *15*	4.4 *7*	220.7957	3$^-$		
		147.1491 *15*	34 *3*	203.1119	1$^-$		
		169.624[a] *15*	3.3 *17*	180.6328	5$^-$		
		189.380 *15*	2.0 *7*	160.8810	3$^+$,4$^+$		
		204.177 *6*	18 *4*	146.0857	3$^+$		
		232.096 *3*	78 *6*	118.1661	2$^-$	E1,E2	
		236.292[&] *4*	≤52[&]	113.9698	3$^+$	(M1,E2)	
		241.180[a] *5*	10.2 *11*	109.0895?	(1)$^-$		
		242.155[&a] *12*	≤5.8[&]	108.1147	5$^+$		
		260.662 *7*	8.0 *7*	89.6129	4$^-$		
		272.031[a] *7*	11.9 *12*	78.2331	1$^+$		
		272.997 *4*	100 *7*	77.2593	3$^-$		
		350.25[&] *4*	≤13[&]	0.0	3$^-$		
353.3462	3,4$^-$	67.305 *5*	5.5 *14*	286.0336	2$^-$		
		69.6269 *12*	7.1 *14*	283.7192	3$^+$		
		94.5638 *10*	8.0 *8*	258.7824	4$^+$,5$^+$		
		96.6210 *10*	7.2 *8*	256.7238	3$^+$,4$^+$		
		115.8549 *12*	7.7 *8*	237.4897	4$^-$		
		125.6252 *12*	16.7 *15*	227.7206	3$^+$		
		128.8435 *20*	7.3 *12*	224.5007	3$^-$		
		132.549 *3*	9.1 *15*	220.7957	3$^-$		
		138.9182 *20*	10.3 *11*	214.4275	4$^+$		
		150.163 *3*	4.7 *7*	203.1827	4$^-$		
		152.216 *3*	7.0 *9*	201.1324	3$^+$		
		156.4302 *20*	7.0 *7*	196.9142	3$^+$,4$^+$		
		178.407 *9*	5.4 *14*	174.9374	2$^-$,3$^-$		
		202.658 *3*	45 *5*	150.6870	4$^-$		
		207.260 *4*	48 *5*	146.0857	3$^+$		
		211.530 *6*	6.0 *10*	141.8259	4$^-$		
		228.820 *7*	6.7 *13*	124.5348	4$^+$		
		235.196 *15*	8 *3*	118.1661	2$^-$		
		239.379[&] *3*	≤154[&]	113.9698	3$^+$	(M1)	0.161
		276.077 *5*	100 *7*	77.2593	3$^-$		
359.7994	2$^-$	111.2957 *12*	8.3 *7*	248.5034	1$^-$,2$^-$		
		135.3008 *12*	22.6 *21*	224.5007	3$^-$		
		138.3458 *12*	15.7 *14*	221.4542	2$^-$		
		139.0057 *15*	6.9 *7*	220.7957	3$^-$		

$^{152}_{63}Eu_{89}$-21

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
359.7994	2⁻	201.742 *3*	14.7 *15*	158.0554	1⁺		
		238.960 *9*	15.7 *25*	120.8384	2⁺		
		241.630[&] *8*	≤24[&]	118.1661	2⁻		
		245.827 *4*	61 *5*	113.9698	3⁺		
		248.353 *4*	34.7 *25*	111.4473	2⁻		
		281.561 *8*	44 *7*	78.2331	1⁺		
		282.548 *5*	100 *8*	77.2593	3⁻	M1,E2	0.087 *17*
		294.496 *15*	30 *7*	65.2969	1⁻		
		314.183 *8*	45 *4*	45.5998	0⁻		
		359.808 *17*	21 *3*	0.0	3⁻		
361.6728?	(2,3,4⁻)	113.1694 *15*	8.7 *8*	248.5034	1⁻,2⁻		
		140.472 *10*	5.9 *23*	221.2091	3⁺		
		240.836[&] *6*	≤93[&]	120.8384	2⁺		
		247.687 *12*	13 *4*	113.9698	3⁺		
		284.417 *7*	100 *8*	77.2593	3⁻		
		296.375[&] *7*	52[&] *5*	65.2969	1⁻		
		316.074[&] *10*	≤180[&]	45.5998	0⁻		
366.4691	2⁻,3⁺	82.7492 *5*	100 *10*	283.7192	3⁺		
		145.019[&] *15*	≤4.7[&]	221.4542	2⁻		
		165.360 *15*	2.2 *11*	201.1324	3⁺		
		169.552 *4*	7.6 *14*	196.9142	3⁺,4⁺		
		208.418 *5*	15.3 *23*	158.0554	1⁺		
		224.635 *5*	100 *10*	141.8259	4⁻		
		245.622 *12*	15 *4*	120.8384	2⁺		
		252.478 *25*	4.9 *15*	113.9698	3⁺		
		276.868 *20*	19 *3*	89.6129	4⁻		
		289.198 *7*	96 *10*	77.2593	3⁻		
		301.174[&] *15*	≤19[&]	65.2969	1⁻		
368.7	(5⁺)	81.6[‡]		287.1582	(4⁺)		
		279.1[‡]		89.6129	4⁻		
374.6091	(2⁺,3⁻)	108.8891 *10*	6.4 *4*	265.7203	3⁻		
		126.104 *3*	1.49 *22*	248.5034	1⁻,2⁻		
		153.155 *3*	3.2 *3*	221.4542	2⁻		
		153.811 *3*	1.9 *3*	220.7957	3⁻		
		171.499 *3*	15 *3*	203.1119	1⁻		
		196.925 *4*	2.8 *4*	177.6865?	(0,1,2,3)⁺		
		225.859 *8*	9.4 *17*	148.7362	(4)⁺		
		228.531 *8*	16 *8*	146.0857	3⁺		
		250.081 *5*	11.8 *10*	124.5348	4⁺		
		253.768 *4*	27.1 *17*	120.8384	2⁺		
		263.158 *4*	63 *4*	111.4473	2⁻		

$^{152}_{63}Eu_{89}$-22

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
374.6091	(2$^+$,3$^-$)	265.513[a] *6*	29 *3*	109.0895?	(1)$^-$		
		296.375[&a] *7*	≤18[&]	78.2331	1$^+$		
		297.344 *6*	54 *5*	77.2593	3$^-$		
		309.314 *4*	100 *8*	65.2969	1$^-$	E1,E2	
		374.590 *12*	19.9 *22*	0.0	3$^-$		
375.4	(9$^+$)	97.2[‡]		278.2	(8$^+$)		
384.8626	3$^-$,4$^-$	160.3611 *17*	15.4 *15*	224.5007	3$^-$		
		163.657 *4*	1.7 *4*	221.2091	3$^+$		
		164.0677 *17*	10.2 *9*	220.7957	3$^-$		
		170.4359 *20*	8.3 *7*	214.4275	4$^+$		
		181.683 *3*	5.8 *6*	203.1827	4$^-$		
		183.732 *3*	21.6 *23*	201.1324	3$^+$		
		204.214 *9*	4.6 *15*	180.6328	5$^-$		
		205.930 *3*	34 *3*	178.9317	3$^+$,4$^+$		
		209.922 *4*	5.6 *7*	174.9374	2$^-$,3$^-$		
		243.032[& *4*]	≤19.3[&]	141.8259	4$^-$		
		260.327 *3*	100 *5*	124.5348	4$^+$	E1	0.0220
		264.020[& *5*]	≤38[&]	120.8384	2$^+$		
		266.701 *6*	19.7 *15*	118.1661	2$^-$		
		270.893 *4*	46 *3*	113.9698	3$^+$	E1	0.0198
		275.764[a *10*]	10.4 *19*	109.0895?	(1)$^-$		
		295.022 *8*	10.4 *12*	89.8496	4$^+$		
		384.883 *25*	6.6 *15*	0.0	3$^-$		
387.4583	2$^+$,3$^+$	103.7389 *15*	5.9 *6*	283.7192	3$^+$		
		130.7328 *15*	10.2 *12*	256.7238	3$^+$,4$^+$		
		133.6964 *15*	6.5 *6*	253.7615	3$^+$		
		173.031 *3*	8.6 *9*	214.4275	4$^+$		
		229.409 *4*	38 *3*	158.0554	1$^+$		
		262.924 *6*	53 *4*	124.5348	4$^+$		
		266.613 *10*	18 *3*	120.8384	2$^+$		
		269.298 *6*	19.1 *20*	118.1661	2$^-$		
		273.488 *7*	100 *12*	113.9698	3$^+$		
		310.203[& *7*]	≤45[&]	77.2593	3$^-$		
		322.182[& *10*]	≤28[&]	65.2969	1$^-$		
388.8452?		132.119 *3*	7.9 *12*	256.7238	3$^+$,4$^+$		
		161.1240 *17*	100 *9*	227.7206	3$^+$		
		167.396 *7*	5.0 *10*	221.4542	2$^-$		
		185.739 *10*	9.8 *15*	203.1119	1$^-$		
		188.090[& *15*]	≤9.8[&]	200.7490	5$^-$		
		191.933 *7*	12.5 *19*	196.9142	3$^+$,4$^+$		
		211.166 *9*	11.3 *17*	177.6865?	(0,1,2,3)$^+$		

$^{152}_{63}Eu_{89}$-23

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
388.8452?		242.750[&] *5*	≤108[&]	146.0857	3^+		
		270.710 *20*	24 *4*	118.1661	2^-		
		277.379 *9*	35 *6*	111.4473	2^-		
		280.724 *7*	50 *5*	108.1147	5^+		
		323.52[#a] *6*	13 *9*	65.2969	1^-		
		343.255 *9*	79 *12*	45.5998	0^-		
393.3279	3^-	109.608 *4*	1.2 *3*	283.7192	3^+		
		127.624 *10*	1.5 *4*	265.7203	3^-		
		178.960[a] *4*	7.6 *9*	214.3613?	2^-		
		190.141 *3*	9.7 *10*	203.1827	4^-		
		190.239 *17*	1.8 *9*	203.1119	1^-		
		212.696 *3*	34 *3*	180.6328	5^-		
		214.398 *3*	100 *9*	178.9317	$3^+,4^+$		
		268.802 *10*	15.2 *24*	124.5348	4^+		
		272.489 *6*	11.6 *10*	120.8384	2^+		
		279.352 *8*	6.1 *9*	113.9698	3^+		
		316.074[&] *10*	≤52[&]	77.2593	3^-		
395.9248	$3^+,4^+$	128.288 *4*	1.9 *3*	267.6410	4^-		
		168.229[#a] *17*	1.8 *5*	227.7206	3^+		
		216.992 *3*	100 *10*	178.9317	$3^+,4^+$	(M1,E2)	0.187 *24*
		235.048 *6*	22 *3*	160.8810	$3^+,4^+$		
		245.230 *4*	53 *4*	150.6870	4^-		
		247.191 *12*	4.3 *11*	148.7362	$(4)^+$		
		271.379 *7*	9.9 *17*	124.5348	4^+		
		287.815 *10*	11.4 *17*	108.1147	5^+		
		306.080 *6*	17.0 *17*	89.8496	4^+		
		318.664 *10*	82 *8*	77.2593	3^-		
399.6752	$2,3^+$	58.4311 *7*	31 *5*	341.2440	2^-		
		113.6419 *20*	7.8 *7*	286.0336	2^-		
		114.539[#a] *5*	2.2 *7*	285.1289	$3^-,4^-$		
		151.1737 *15*	13.4 *12*	248.5034	$1^-,2^-$		
		171.962 *5*	9.2 *16*	227.7206	3^+		
		178.2242[#a] *20*	62 *7*	221.4542	2^-		
		178.462 *3*	49 *5*	221.2091	3^+		
		178.882 *4*	17.2 *18*	220.7957	3^-		
		196.565[&] *3*	≤39[&]	203.1119	1^-		
		198.543 *3*	17.3 *18*	201.1324	3^+		
		220.747 *4*	62 *7*	178.9317	$3^+,4^+$		
		241.630[&] *8*	≤39[&]	158.0554	1^+		
		253.595 *5*	24.1 *16*	146.0857	3^+		
		278.858 *12*	15 *4*	120.8384	2^+		
		281.500 *8*	82 *12*	118.1661	2^-		

$^{152}_{63}Eu_{89}$-24

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.
399.6752	2,3$^+$	288.218 *5*	85 *8*	111.4473	2$^-$	
		321.433 *7*	100 *8*	78.2331	1$^+$	
		334.373[&] *10*	≤62[&]	65.2969	1$^-$	
		399.665 *12*	47 *7*	0.0	3$^-$	
412.7436	3$^+$	118.2940 *15*	4.4 *5*	294.4522	3$^-$,4$^-$	
		145.105 *7*	2.0 *3*	267.6410	4$^-$	
		158.969 *12*	2.0 *8*	253.7615	3$^+$	
		188.242 *3*	13.5 *13*	224.5007	3$^-$	
		191.285 *9*	3.9 *10*	221.4542	2$^-$	
		198.305 *17*	4.1 *13*	214.4275	4$^+$	
		198.364[&] *12*	≤5.0[&]	214.3613?	2$^-$	
		237.811 *3*	100 *7*	174.9374	2$^-$,3$^-$	
		262.052 *5*	25.0 *15*	150.6870	4$^-$	
		294.574 *15*	24 *5*	118.1661	2$^-$	
		301.275 *17*	8.2 *19*	111.4473	2$^-$	
		322.901 *15*	15 *3*	89.8496	4$^+$	
		334.504 *20*	15 *4*	78.2331	1$^+$	
		335.491 *20*	8 *4*	77.2593	3$^-$	
		412.725 *17*	16.5 *26*	0.0	3$^-$	
424.36	10$^-$	137.89[†] *2*	100	286.47	9$^-$	D+Q[†]
434.7380	4	94.0141 *8*	6.4 *6*	340.7202	(3$^-$)	
		138.4105 *17*	3.6 *3*	296.3269	3$^+$	
		169.010 *6*	5.0 *8*	265.7203	3$^-$	
		180.981 *4*	5.0 *10*	253.7615	3$^+$	
		188.090[&] *15*	≤3.2[&]	246.6554	3$^-$,4$^-$	
		197.249 *3*	17.8 *21*	237.4897	4$^-$	
		210.233 *4*	11.6 *21*	224.5007	3$^-$	
		220.314 *4*	10.0 *10*	214.4275	4$^+$	
		231.552 *6*	10 *3*	203.1827	4$^-$	
		231.614[&] *8*	≤9.9[&]	203.1119	1$^-$	
		233.610[&] *4*	≤29[&]	201.1324	3$^+$	
		254.108 *4*	71 *4*	180.6328	5$^-$	
		257.047 *7*	14.8 *15*	177.6865?	(0,1,2,3)$^+$	
		259.802 *6*	10.9 *10*	174.9374	2$^-$,3$^-$	
		273.858 *5*	100 *9*	160.8810	3$^+$,4$^+$	
		284.042 *6*	29 *3*	150.6870	4$^-$	
		286.004 *7*	16.8 *14*	148.7362	(4)$^+$	
		288.659 *6*	47 *4*	146.0857	3$^+$	
		310.203[&] *7*	≤36[&]	124.5348	4$^+$	
		320.760 *7*	58 *6*	113.9698	3$^+$	
		326.620 *8*	89 *7*	108.1147	5$^+$	

$^{152}_{63}Eu_{89}$-25

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
434.7380	4	344.85[#a] *4*	10 *6*	89.8496	4^+		
		345.10 *4*	10 *3*	89.6129	4^-		
		357.458 *12*	32 *3*	77.2593	3^-		
436.1652	$2^+,3^+$	76.3661 *6*	31 *3*	359.7994	2^-		
		163.7854 *17*	15.6 *14*	272.3782	2^+		
		182.399 *5*	42 *8*	253.7615	3^+		
		198.812 *5*	9.3 *19*	237.3483	2^-		
		211.663 *3*	41 *4*	224.5007	3^-		
		214.718 *4*	24 *3*	221.4542	2^-		
		214.981 *15*	8.2 *21*	221.2091	3^+		
		221.813[a] *7*	14.8 *25*	214.3613?	2^-		
		233.061 *9*	14 *3*	203.1119	1^-		
		239.248 *5*	42 *4*	196.9142	$3^+,4^+$		
		261.223 *7*	22 *3*	174.9374	$2^-,3^-$		
		278.105 *6*	26.1 *23*	158.0554	1^+		
		290.123 *25*	10.4 *21*	146.0857	3^+		
		318.005 *7*	51 *4*	118.1661	2^-		
		322.182[&] *10*	≤34[&]	113.9698	3^+		
		324.716 *8*	40 *4*	111.4473	2^-		
		346.34 *4*	17 *4*	89.8496	4^+		
		357.938 *9*	100 *7*	78.2331	1^+		
		358.930 *17*	32 *4*	77.2593	3^-		
		436.30 *8*	15 *6*	0.0	3^-		
440.5049	$3,4^-$	99.2611 *7*	62 *6*	341.2440	2^-		
		101.285 *3*	9.1 *11*	339.2177	2		
		186.7420 *20*	98 *11*	253.7615	3^+		
		237.411 *9*	13 *3*	203.1119	1^-		
		239.379[&] *3*	≤250[&]	201.1324	3^+	(M1)	0.161
		240.836[&] *6*	≤102[&]	199.6648	$4^+,5^+$		
		279.609 *20*	29 *15*	160.8810	$3^+,4^+$		
		289.832 *10*	28 *4*	150.6870	4^-		
		315.956 *15*	50 *13*	124.5348	4^+		
		326.515 *15*	100 *15*	113.9698	3^+		
		328.97[&] *5*	≤11[&]	111.4473	2^-		
		375.209[&] *25*	≤20[&]	65.2969	1^-		
		440.57 *6*	57 *14*	0.0	3^-		
442.8582	$2^+,3^-$	133.495 *7*	5.5 *10*	309.3744	3^-		
		186.135 *9*	8 *4*	256.7238	$3^+,4^+$		
		194.354 *3*	55 *6*	248.5034	$1^-,2^-$		
		228.432 *6*	38 *6*	214.4275	4^+		
		228.498[a] *3*	310 *30*	214.3613?	2^-	E1	0.0308
		245.932 *7*	26 *4*	196.9142	$3^+,4^+$		

$^{152}_{63}Eu_{89}$-26

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
442.8582	2$^+$,3$^-$	267.91 *3*	12 *5*	174.9374	2$^-$,3$^-$		
		281.998 *15*	43 *10*	160.8810	3$^+$,4$^+$		
		322.014 *9*	100 *10*	120.8384	2$^+$		
		324.51[#a] *10*	15 *12*	118.1661	2$^-$		
		328.97[&] *5*	≤15[&]	113.9698	3$^+$		
		352.974[#a] *20*	220 *33*	89.8496	4$^+$		
		364.627[&] *20*	≤135[&]	78.2331	1$^+$		
		377.575 *17*	93 *9*	65.2969	1$^-$		
446.2221	3,4$^-$	86.428 *3*	2.5 *6*	359.7994	2$^-$		
		104.981 *3*	3.6 *5*	341.2440	2$^-$		
		145.019[&] *15*	≤2.7[&]	301.1896	3$^+$,4$^+$		
		162.5023 *20*	6.7 *6*	283.7192	3$^+$		
		199.561 *3*	34 *4*	246.6554	3$^-$,4$^-$		
		218.503 *10*	5.6 *8*	227.7206	3$^+$		
		225.411 *20*	4.6 *18*	220.7957	3$^-$		
		231.797 *6*	8.1 *8*	214.4275	4$^+$		
		243.032[&] *4*	≤39[&]	203.1827	4$^-$		
		267.265 *17*	3.6 *14*	178.9317	3$^+$,4$^+$		
		271.284[&] *6*	≤53[&]	174.9374	2$^-$,3$^-$		
		285.31 *4*	11 *5*	160.8810	3$^+$,4$^+$		
		295.542 *6*	100 *8*	150.6870	4$^-$		
		297.475 *12*	8.9 *17*	148.7362	(4)$^+$		
		304.401[&] *10*	≤29[&]	141.8259	4$^-$		
		321.68 *5*	5 *3*	124.5348	4$^+$		
		332.253 *17*	11 *3*	113.9698	3$^+$		
		334.785 *9*	44 *4*	111.4473	2$^-$		
		356.35 *6*	16 *4*	89.8496	4$^+$		
447.79	11$^-$	23.43[†] *3*	11.9[†] *19*	424.36	10$^-$	D[†]	
		161.32[†] *2*	100[†] *10*	286.47	9$^-$	E2[†]	0.446
460.0672	2$^-$	114.420 *5*	3.0 *3*	345.6396	(1$^+$,2$^+$)		
		192.428 *3*	72 *7*	267.6410	4$^-$		
		210.744[a] *12*	6.9 *14*	249.3309?	1$^+$		
		232.345 *5*	14.2 *15*	227.7206	3$^+$		
		256.886 *6*	27.4 *22*	203.1827	4$^-$		
		258.920 *12*	18 *5*	201.1324	3$^+$		
		339.213[&] *25*	≤19[&]	120.8384	2$^+$		
		346.124 *25*	24 *5*	113.9698	3$^+$		
		348.619 *10*	90 *8*	111.4473	2$^-$		
		394.804 *25*	21 *5*	65.2969	1$^-$		
		414.484 *12*	100 *10*	45.5998	0$^-$		
462.5559	4	62.8810 *6*	100 *15*	399.6752	2,3$^+$		

$^{152}_{63}Eu_{89}$-27

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[@]
462.5559	4	177.430 *3*	4.0 *6*	285.1289	3^-,4^-		
		196.829 *3*	11.6 *14*	265.7203	3^-		
		205.825 *12*	5.7 *15*	256.7238	3^+,4^+		
		241.321 *15*	8.1 *12*	221.2091	3^+		
		259.381 *9*	7.2 *18*	203.1827	4^-		
		261.419 *5*	80 *5*	201.1324	3^+		
		261.799 *9*	13.2 *23*	200.7490	5^-		
		281.918 *6*	43 *5*	180.6328	5^-		
		283.603 *15*	12.6 *15*	178.9317	3^+,4^+		
		284.865 *25*	10 *3*	177.6865?	$(0,1,2,3)^+$		
		287.611 *6*	39 *4*	174.9374	2^-,3^-		
		311.86 *4*	10.5 *18*	150.6870	4^-		
		316.478 *7*	24.8 *23*	146.0857	3^+		
		354.444 *9*	47 *3*	108.1147	5^+		
		372.75 *3*	15.5 *24*	89.8496	4^+		
		385.28 *7*	16 *3*	77.2593	3^-		
468.6	(6^+)	99.9[‡]		368.7	(5^+)		
482.9469		154.802 *3*	2.7 *4*	328.1485	2^-		
		158.6502 *17*	17.5 *16*	324.2955	$(2)^+$		
		173.569 *5*	2.9 *7*	309.3744	3^-		
		197.822 *8*	3.7 *12*	285.1289	3^-,4^-		
		233.610[&a] *4*	≤30[&]	249.3309?	1^+		
		236.292[&] *4*	≤50[&]	246.6554	3^-,4^-	(M1,E2)	0.146 *22*
		258.449 *8*	7.9 *22*	224.5007	3^-		
		324.90 *3*	13 *3*	158.0554	1^+		
		358.390 *25*	13 *4*	124.5348	4^+		
		362.05 *3*	19 *3*	120.8384	2^+		
		364.768 *9*	100 *8*	118.1661	2^-		
		373.91[&a] *4*	≤12[&]	109.0895?	$(1)^-$		
		404.741 *15*	22 *4*	78.2331	1^+		
		417.677 *20*	20.9 *21*	65.2969	1^-		
		437.337 *17*	27 *3*	45.5998	0^-		
483.3425?	$(3)^+$	70.604 *4*	1.7 *7*	412.7436	3^+		
		137.707 *10*	1.3 *3*	345.6396	$(1^+,2^+)$		
		173.960 *8*	1.7 *4*	309.3744	3^-		
		197.313[&] *4*	≤5.9[&]	286.0336	2^-		
		198.227 *15*	2.0 *7*	285.1289	3^-,4^-		
		215.694 *7*	3.9 *7*	267.6410	4^-		
		258.818[&] *25*	≤3.4[&]	224.5007	3^-		
		268.99[#a] *3*	4.0 *15*	214.3613?	2^-		
		282.200 *9*	8.6 *15*	201.1324	3^+		
		286.406 *15*	8.1 *15*	196.9142	3^+,4^+		

$^{152}_{63}Eu_{89}$-28

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α[@]
483.3425?	(3)$^+$	304.401[&] *10*	≤19[&]	178.9317	3$^+$,4$^+$			
		322.455 *17*	17.7 *25*	160.8810	3$^+$,4$^+$			
		325.292 *6*	100 *8*	158.0554	1$^+$	(E2)		0.0454
		334.589 *12*	30 *3*	148.7362	(4)$^+$			
		362.505 *12*	13.6 *20*	120.8384	2$^+$			
		371.87 *4*	13.6 *26*	111.4473	2$^-$			
		375.209[&] *25*	≤5.6[&]	108.1147	5$^+$			
		393.486 *20*	15 *6*	89.8496	4$^+$			
488.0	7$^-$	156.5[‡] *3*		332.5	6$^-$	D[‡]		
492.0894	3$^-$,4$^-$	107.225 *7*	4.0 *3*	384.8626	3$^-$,4$^-$			
		144.3424 *12*	35 *3*	347.7468	3$^+$,4			
		159.300 *3*	14.0 *25*	332.7921	3$^+$			
		182.723 *6*	5.6 *21*	309.3744	3$^-$			
		190.904 *7*	12 *3*	301.1896	3$^+$,4$^+$			
		195.764[#a] *4*	12.8 *16*	296.3269	3$^+$			
		206.947 *8*	11 *3*	285.1289	3$^-$,4$^-$			
		238.321 *5*	28 *5*	253.7615	3$^+$			
		245.439 *7*	39 *5*	246.6554	3$^-$,4$^-$			
		264.386 *10*	21 *3*	227.7206	3$^+$			
		267.590 *6*	100 *9*	224.5007	3$^-$			
		270.603 *17*	31 *3*	221.4542	2$^-$			
		271.284[&] *6*	≤123[&]	220.7957	3$^-$			
		277.729[a] *5*	58 *5*	214.3613?	2$^-$			
		290.966 *9*	39 *7*	201.1324	3$^+$			
		291.347 *12*	23 *4*	200.7490	5$^-$			
		317.154 *7*	72 *5*	174.9374	2$^-$,3$^-$			
		350.25[&] *4*	≤30[&]	141.8259	4$^-$			
		371.21[#a] *5*	33 *10*	120.8384	2$^+$			
		373.91[&] *4*	≤28[&]	118.1661	2$^-$			
		378.13 *7*	23 *13*	113.9698	3$^+$			
		414.823 *17*	75 *12*	77.2593	3$^-$			
		492.06 *15*	25 *13*	0.0	3$^-$			
495.80	10$^-$	189.08[†] *5*	100[†] *10*	306.72	9$^-$	M1+E2[†]	−0.34[†] *10*	0.302 *5*
		348.0[†] *2*	41[†] *9*	147.86	8$^-$			
508.4783?	2$^+$,3$^+$	95.7382 *20*	2.5 *5*	412.7436	3$^+$			
		119.6328[&] *12*	≤15.0[&]	388.8452?				
		133.874 *6*	3.3 *3*	374.6091	(2$^+$,3$^-$)			
		160.726 *4*	2.2 *5*	347.7468	3$^+$,4			
		167.757[#a] *5*	3.1 *8*	340.7202	(3$^-$)			
		199.104[#] *17*	4 *3*	309.3744	3$^-$			

$^{152}_{63}Eu_{89}$-29

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α[@]
508.4783?	2$^+$,3$^+$	207.296 *3*	100 *10*	301.1896	3$^+$,4$^+$			
		240.836[&] *6*	≤43[&]	267.6410	4$^-$			
		242.750[&] *5*	≤39[&]	265.7203	3$^-$			
		251.791 *25*	6.2 *19*	256.7238	3$^+$,4$^+$			
		287.276 *20*	5.3 *23*	221.2091	3$^+$			
		294.060 *15*	9.8 *23*	214.4275	4$^+$			
		347.601 *17*	15 *3*	160.8810	3$^+$,4$^+$			
		350.420 *20*	14 *4*	158.0554	1$^+$			
		387.624 *10*	30 *5*	120.8384	2$^+$			
		390.314 *12*	53 *5*	118.1661	2$^-$			
		397.015 *10*	45 *5*	111.4473	2$^-$			
		399.389[a] *15*	17.3 *23*	109.0895?	(1)$^-$			
		430.30 *6*	16 *5*	78.2331	1$^+$			
510.6725	3	136.067 *9*	1.4 *5*	374.6091	(2$^+$,3$^-$)			
		169.955 *4*	5.6 *9*	340.7202	(3$^-$)			
		209.478 *4*	31 *3*	301.1896	3$^+$,4$^+$			
		243.032[&] *4*	≤52[&]	267.6410	4$^-$			
		264.020[&] *5*	≤102[&]	246.6554	3$^-$,4$^-$			
		273.314 *12*	15.6 *19*	237.3483	2$^-$			
		286.164 *12*	13.8 *14*	224.5007	3$^-$			
		309.526 *8*	28 *4*	201.1324	3$^+$			
		313.763 *8*	33 *5*	196.9142	3$^+$,4$^+$			
		359.991 *10*	71 *8*	150.6870	4$^-$			
		364.627[&] *20*	≤56[&]	146.0857	3$^+$			
		368.860 *9*	100 *8*	141.8259	4$^-$			
		386.119 *15*	30 *3*	124.5348	4$^+$			
		389.805 *17*	24 *4*	120.8384	2$^+$			
		392.55 *3*	30 *5*	118.1661	2$^-$			
		396.74 *4*	11 *3*	113.9698	3$^+$			
		421.01 *8*	14 *7*	89.6129	4$^-$			
625.74	12$^-$	177.96[†] *3*		447.79	11$^-$	D[†]		
711.68	11$^-$	215.94[†] *12*	100[†] *11*	495.80	10$^-$	M1+E2[†]	−0.4[†] *+3−4*	0.207 *12*
		404.8[†] *2*	43[†] *9*	306.72	9$^-$			
758.84	13$^-$	133.10[†] *2*	23.8[†] *24*	625.74	12$^-$	D+Q[†]		
		311.0[†] *1*	100[†] *10*	447.79	11$^-$	E2[†]		0.0521
950.18	12$^-$	238.48[†] *6*	100[†] *40*	711.68	11$^-$	M1+E2[†]	−0.8[†] *+3−11*	0.146 *17*
		454.4[†] *3*	82[†] *14*	495.80	10$^-$			
954.03	14$^-$	195.19[†] *5*	100[†] *10*	758.84	13$^-$	D+Q[†]		
		328.5[†] *3*	53[†] *8*	625.74	12$^-$	E2[†]		0.0441

$^{152}_{63}Eu_{89}$-30

Adopted Levels, Gammas (continued)

γ(^{152}Eu) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α[@]
1206.27	15⁻	252.5[†] *3*	6.3[†] *23*	954.03	14⁻			
		447.4[†] *1*	100[†] *10*	758.84	13⁻	E2[†]		0.0181
1208.47	13⁻	258.25[†] *10*	51[†] *22*	950.18	12⁻	M1+E2[†]	0.52[†] *18*	0.123 *5*
		497.1[†] *3*	100[†] *44*	711.68	11⁻			
1406.58	16⁻	200.31[†] *2*	63[†] *7*	1206.27	15⁻	D[†]		
		452.5[†] *2*	100[†] *20*	954.03	14⁻	E2[†]		0.0175
1485.03	14⁻	276.5[†] *3*	15[†] *8*	1208.47	13⁻			
		534.9[†] *3*	100[†] *31*	950.18	12⁻			
1760.42	17⁻	554.2[†] *3*		1206.27	15⁻	E2[†]		0.0102
1775.5	15⁻	290.5[†] *3*	25[†] *12*	1485.03	14⁻			
		567.0[†] *5*	100[†] *30*	1208.47	13⁻			
1958.62	18⁻	198.20[†] *10*	19[†] *4*	1760.42	17⁻			
		552.0[†] *3*	100[†] *15*	1406.58	16⁻	E2[†]		0.0103
2079.7	16⁻	304.5[†] *5*	25[†] *15*	1775.5	15⁻			
		594.5[†] *5*	100[†] *40*	1485.03	14⁻			
2401.5	19⁻	641.1[†] *3*		1760.42	17⁻	E2[†]		0.0071
2592.2	20⁻	633.6[†] *3*		1958.62	18⁻	E2[†]		0.0073

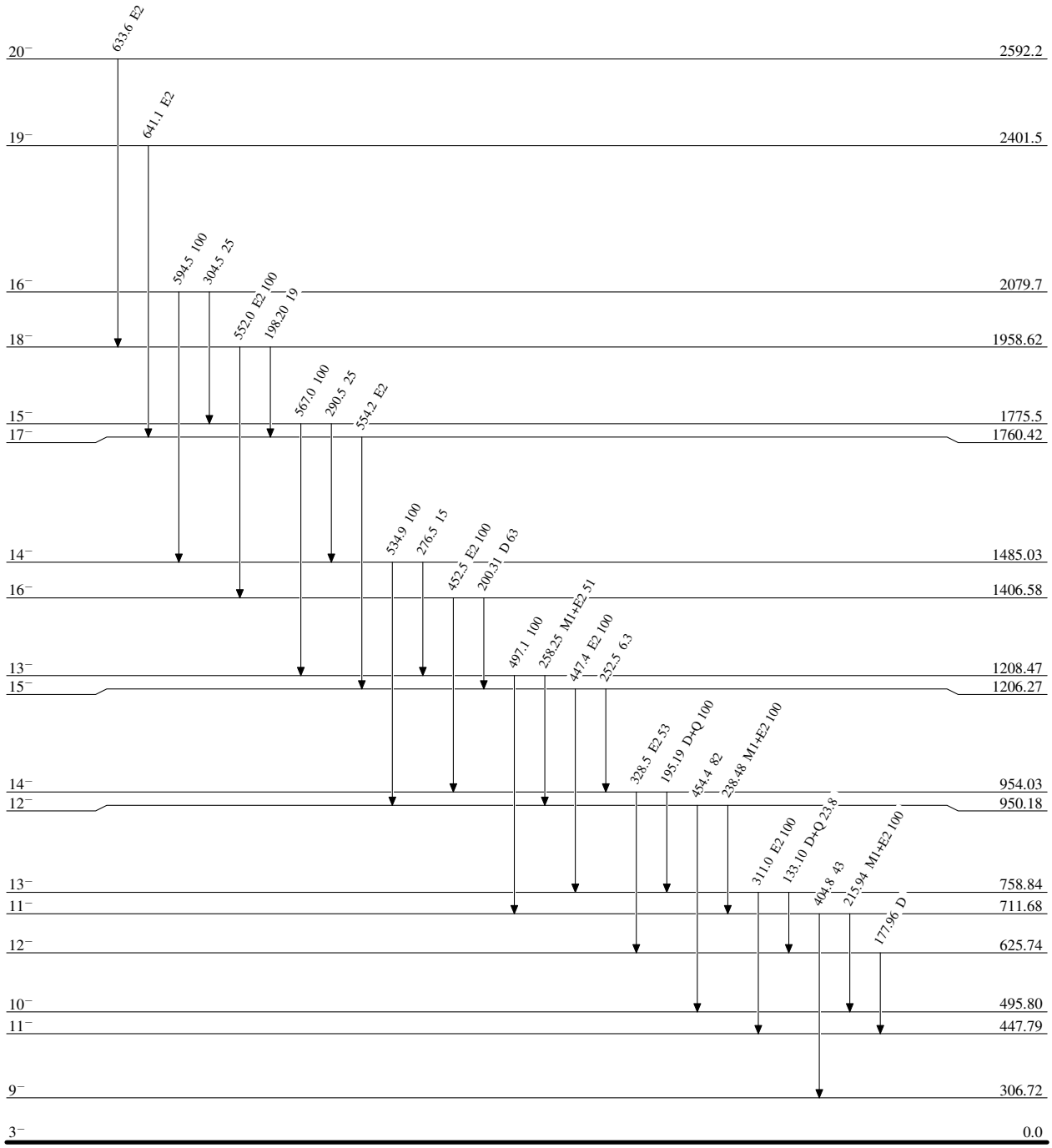
[†] From (^{7}Li,5nγ).
[‡] From (p,3nγ).
[#] Questionable line.
[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[&] Multiply placed with undivided intensity.
[a] Placement of transition in the level scheme is uncertain.

$^{152}_{63}Eu_{89}$-31

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{152}_{63}Eu_{89}$

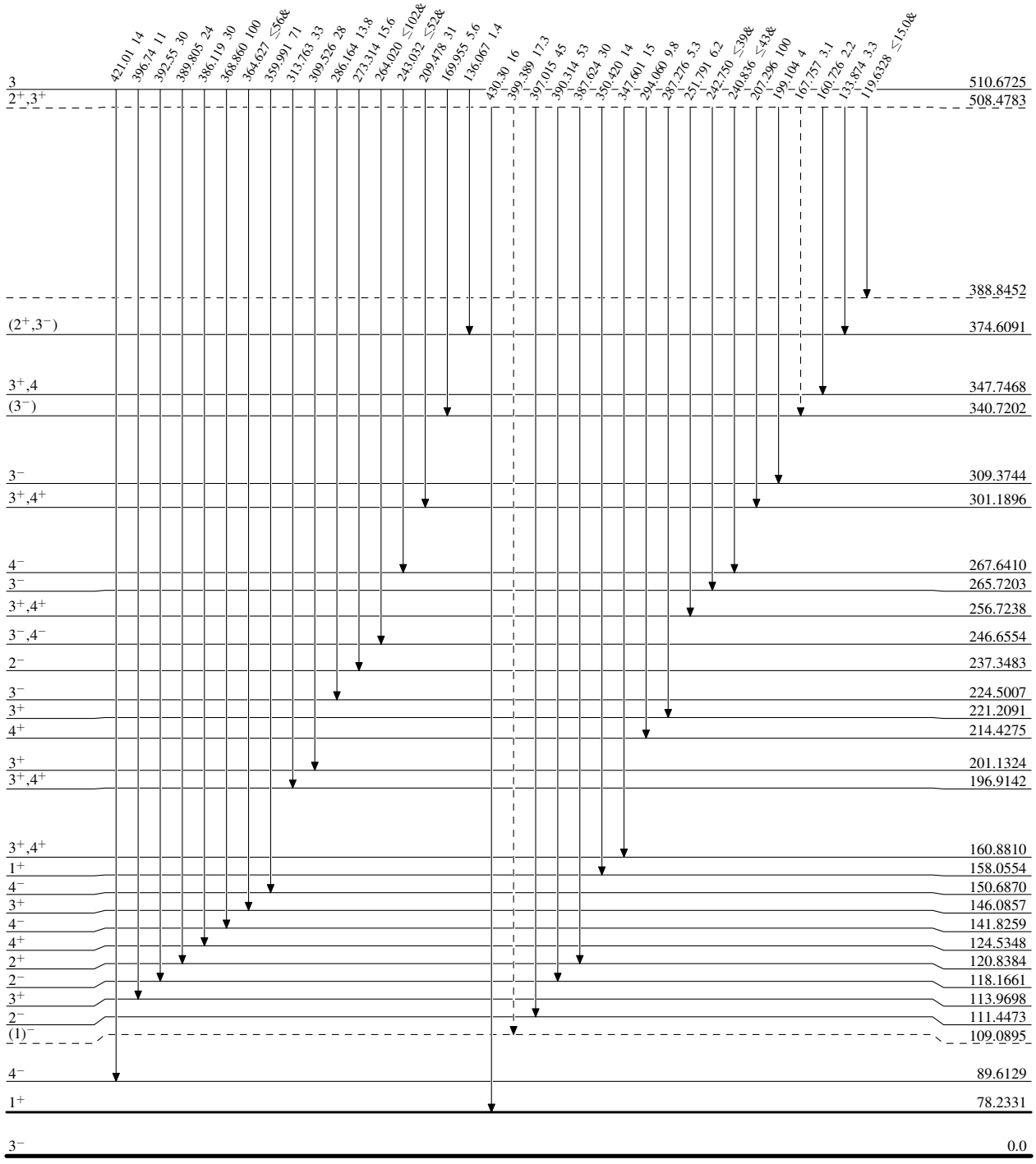
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

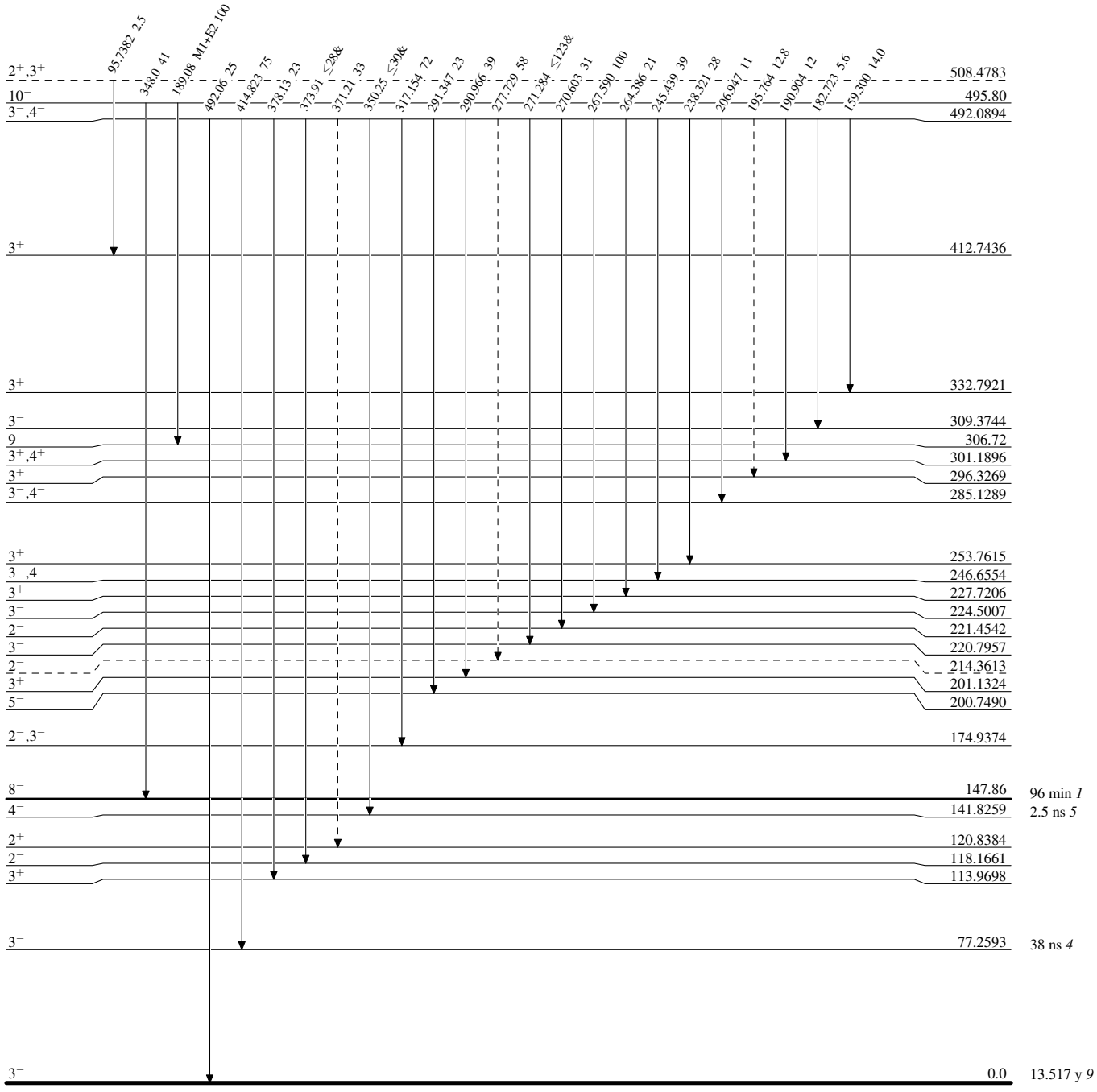
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

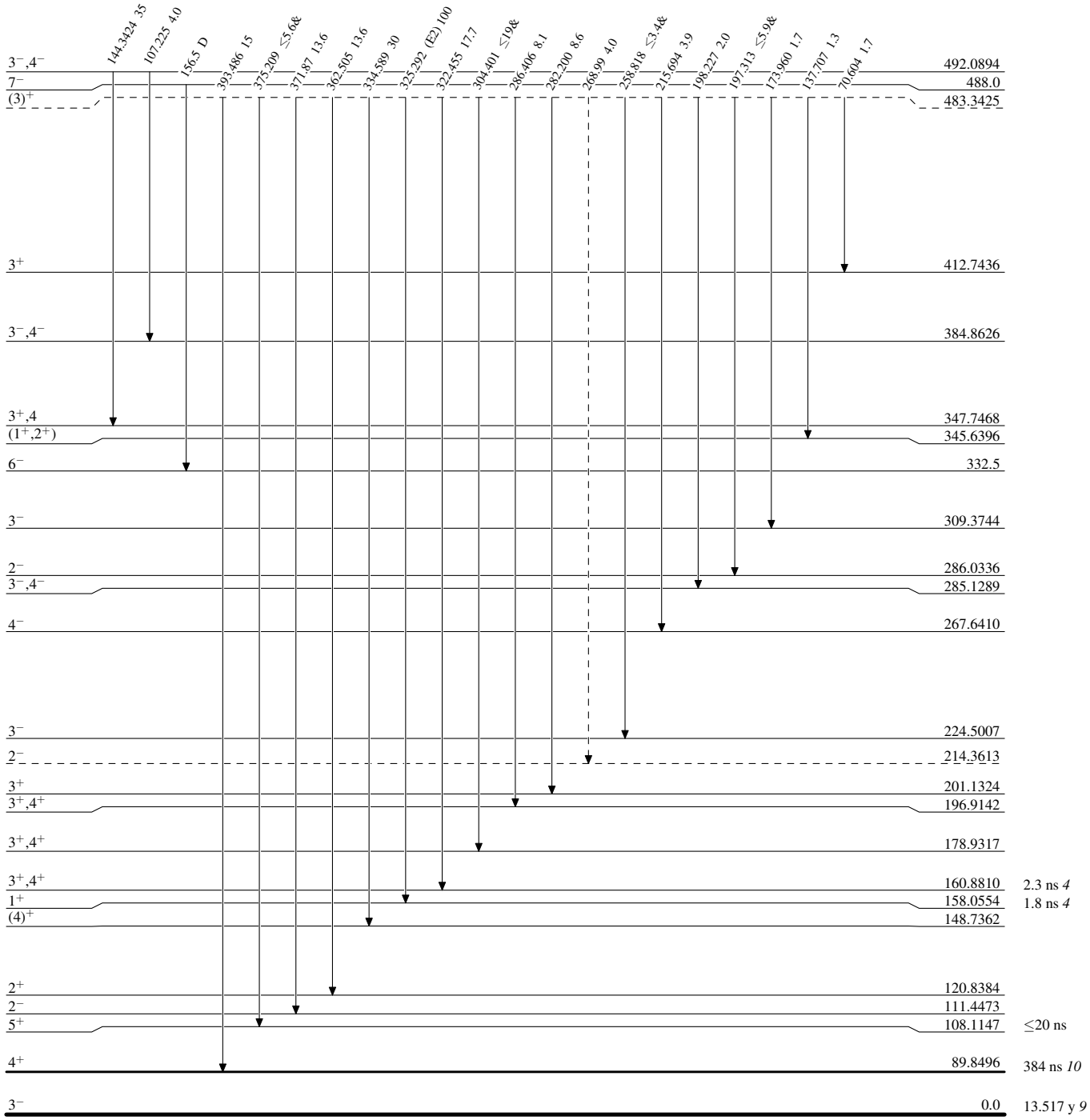
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



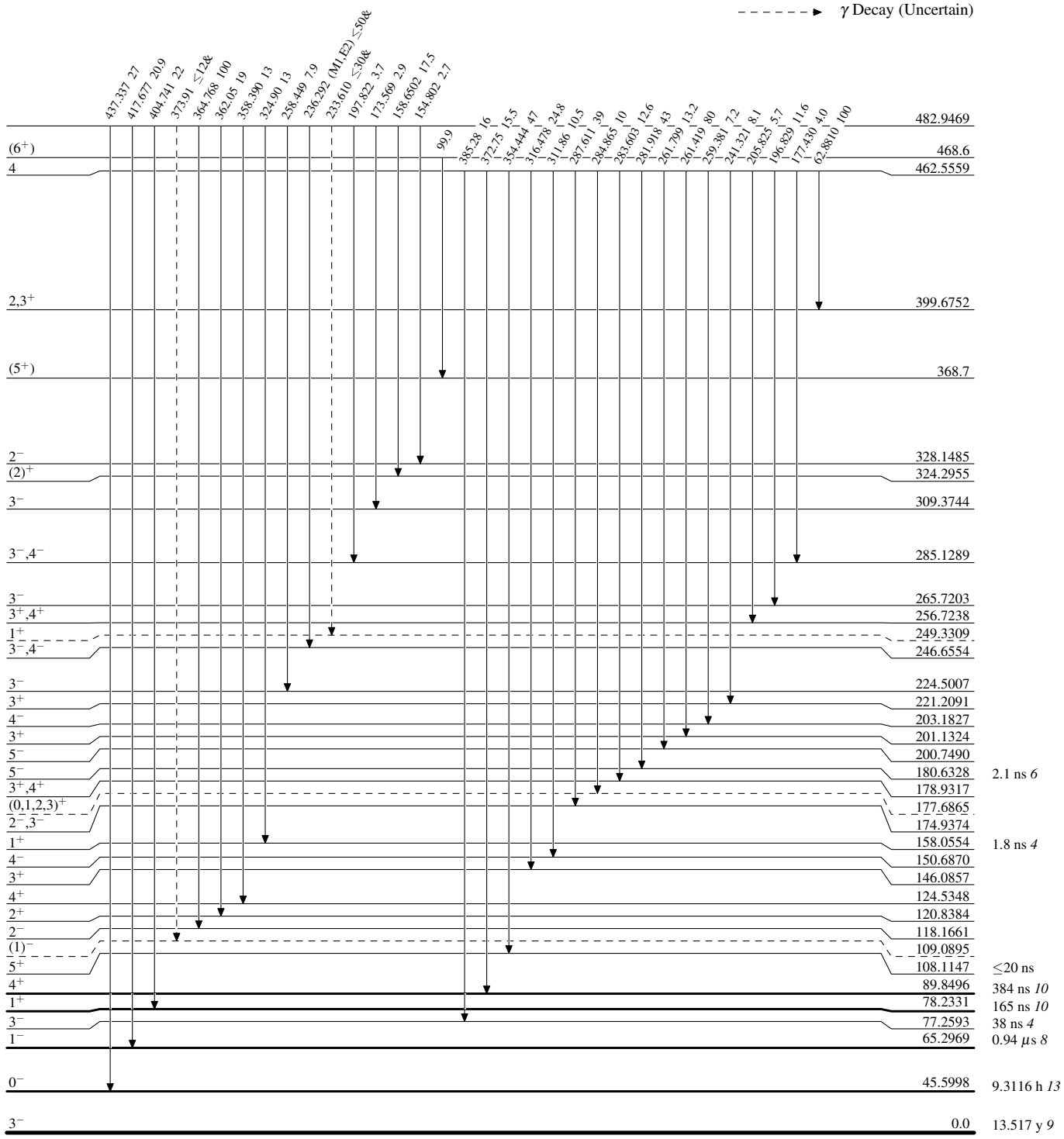
$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{152}_{63}Eu_{89}$

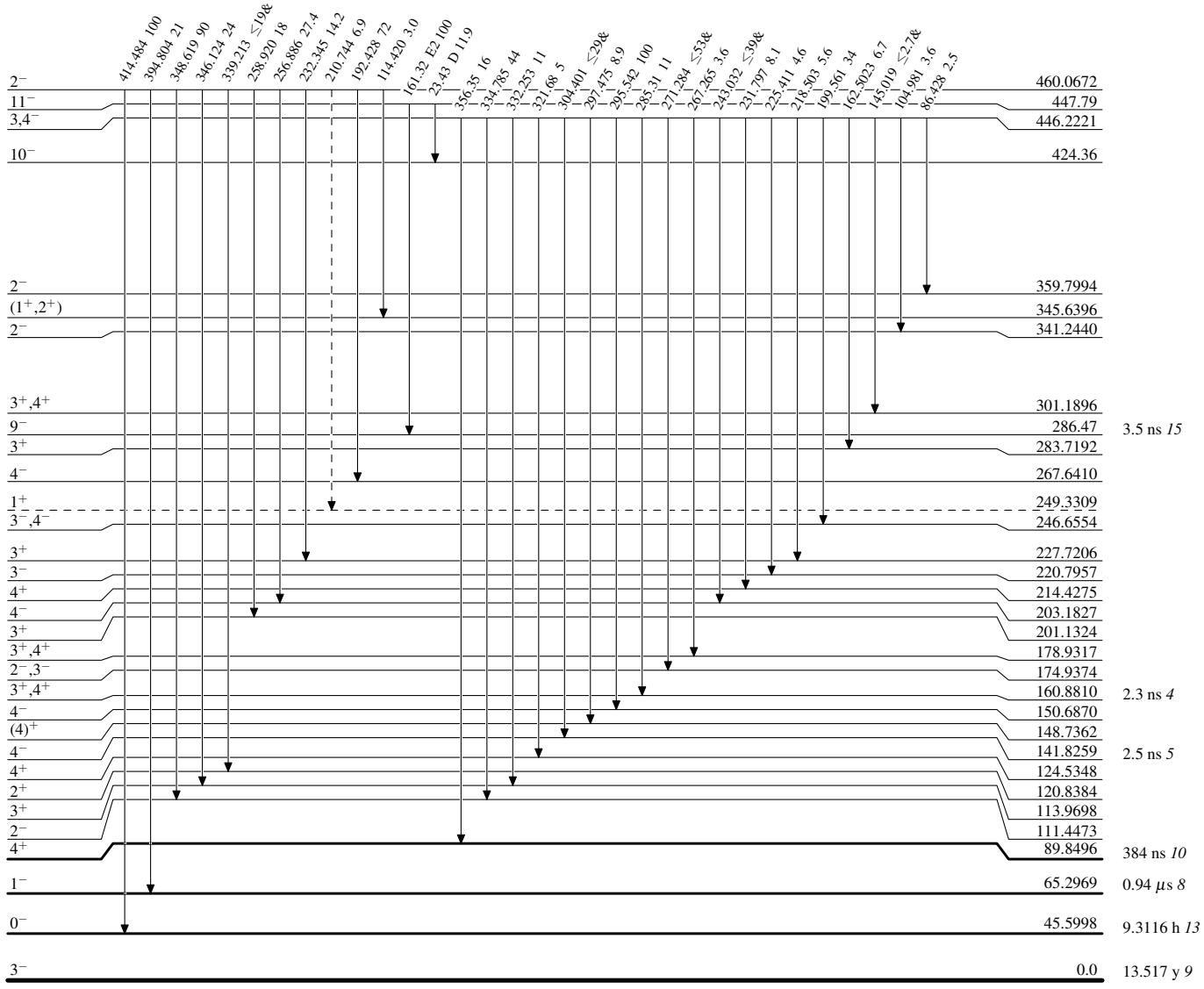
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

– – – – – – ► γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

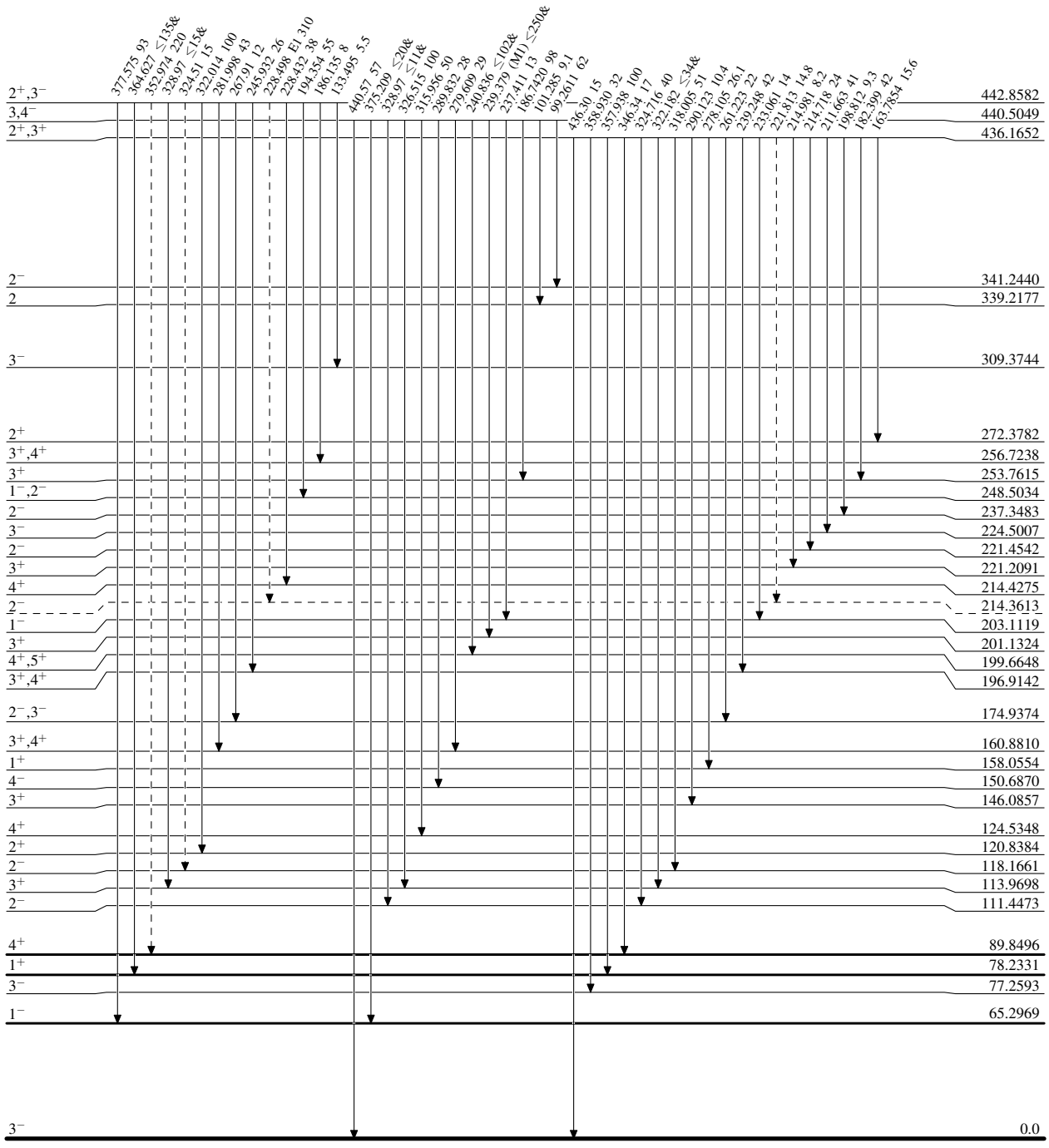
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

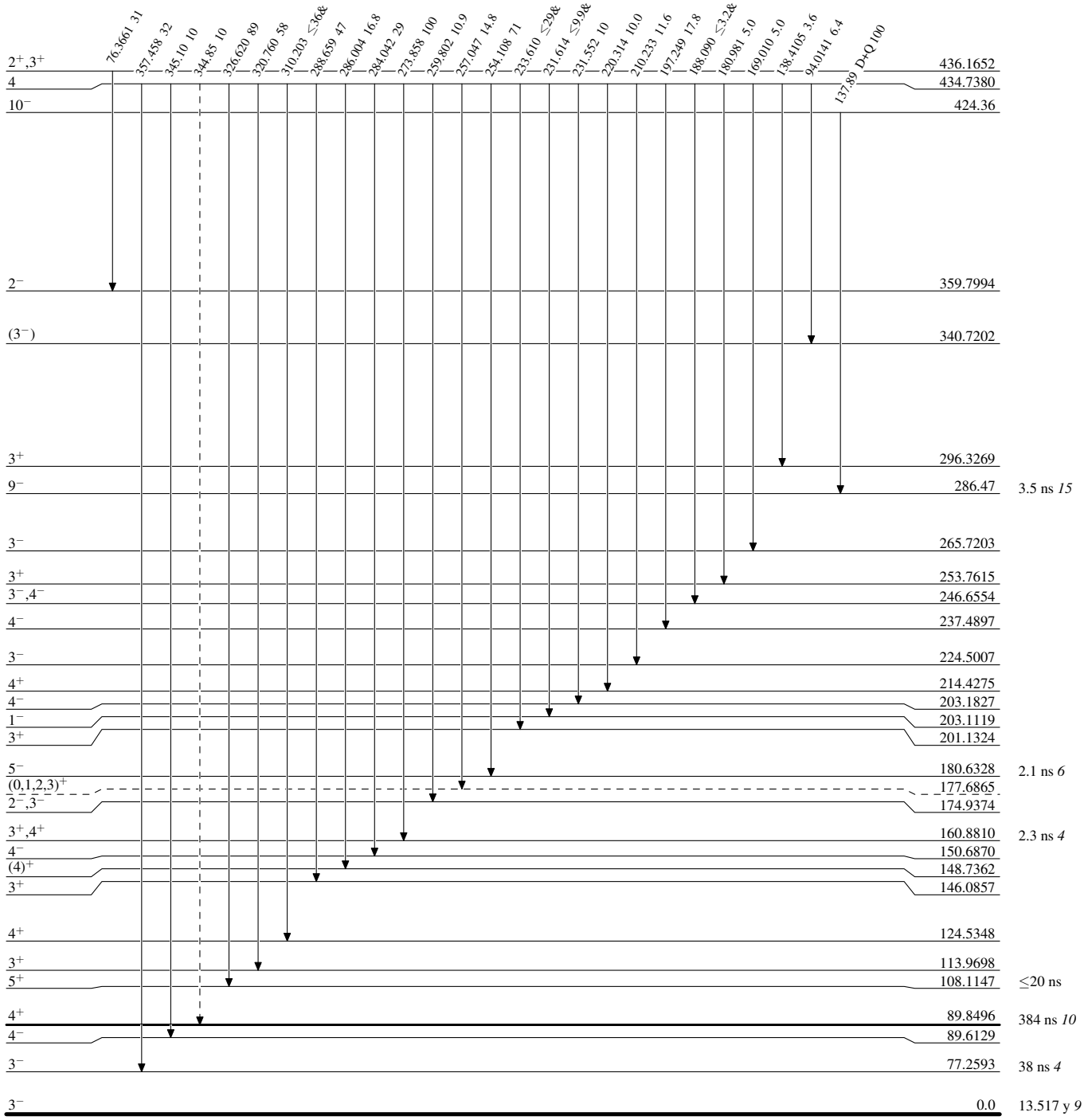
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

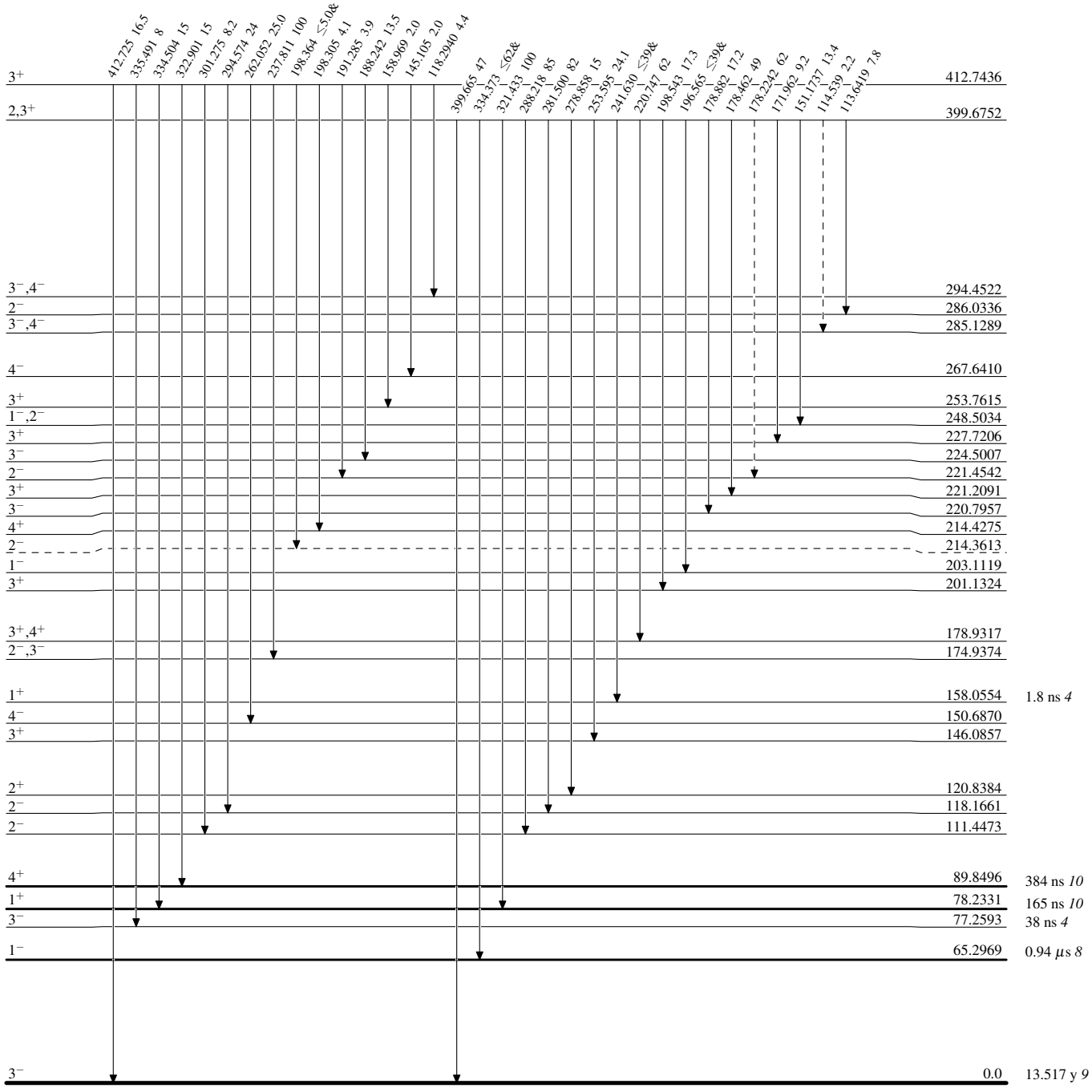
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



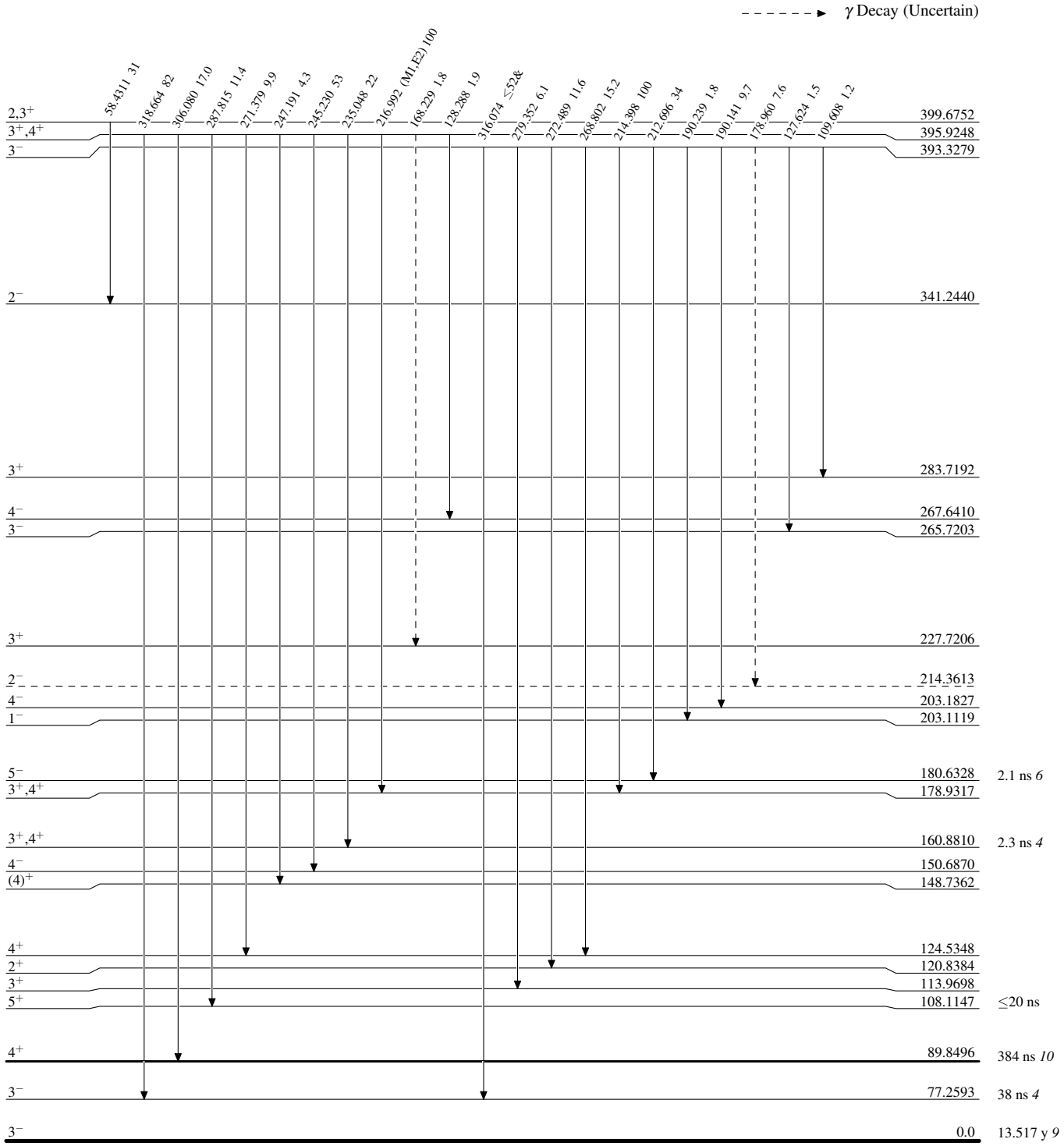
$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{152}_{63}Eu_{89}$

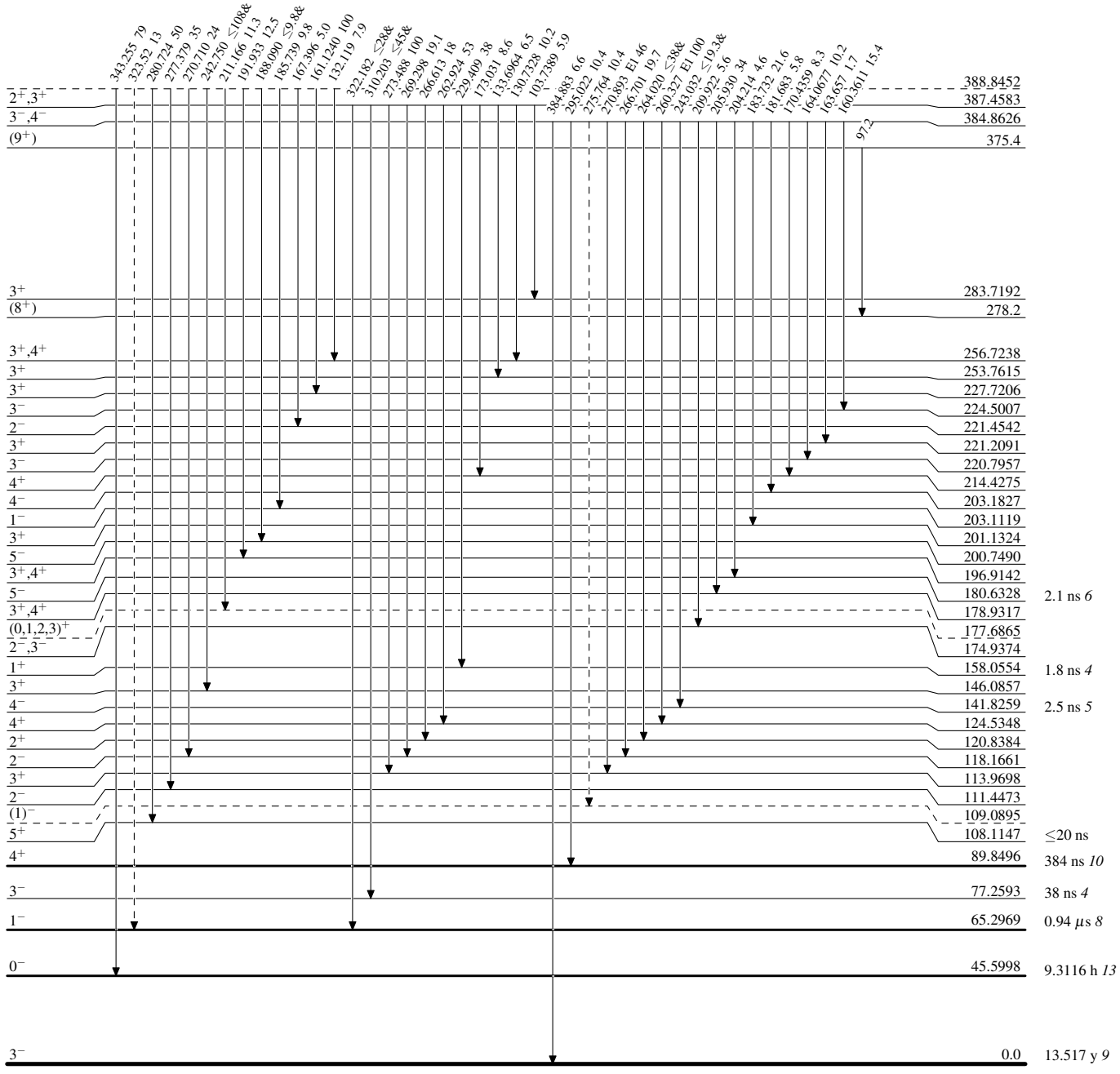
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

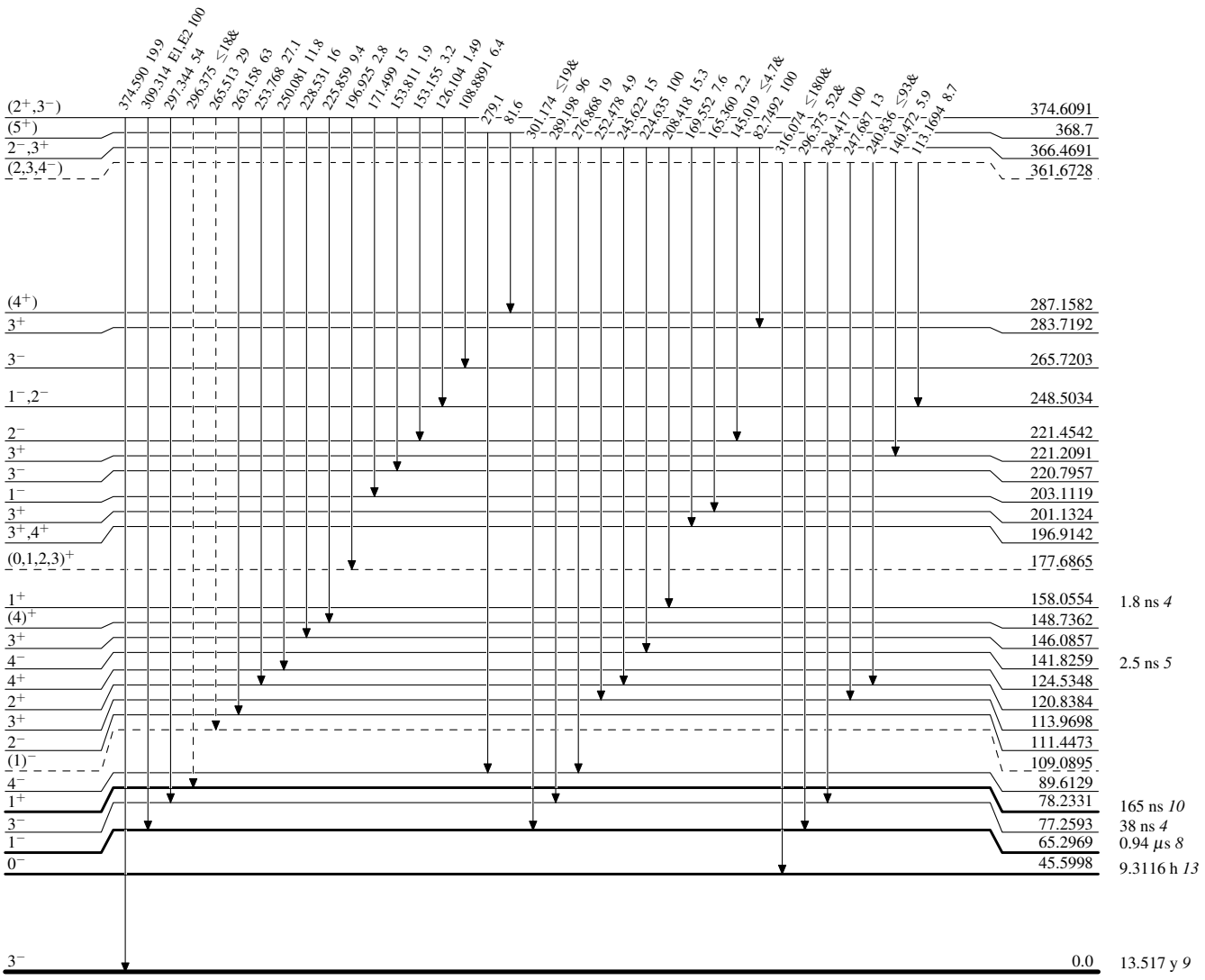
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)

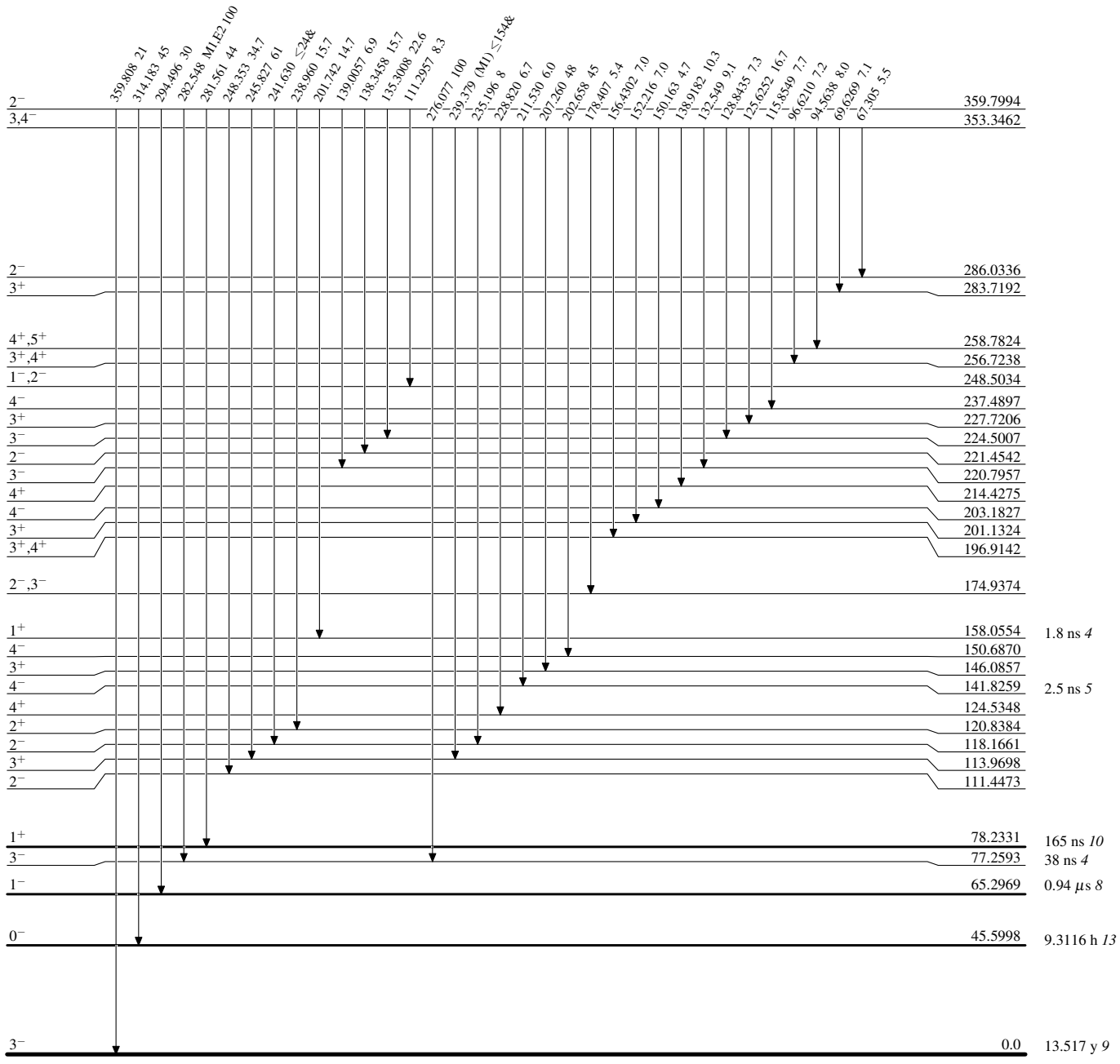


$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



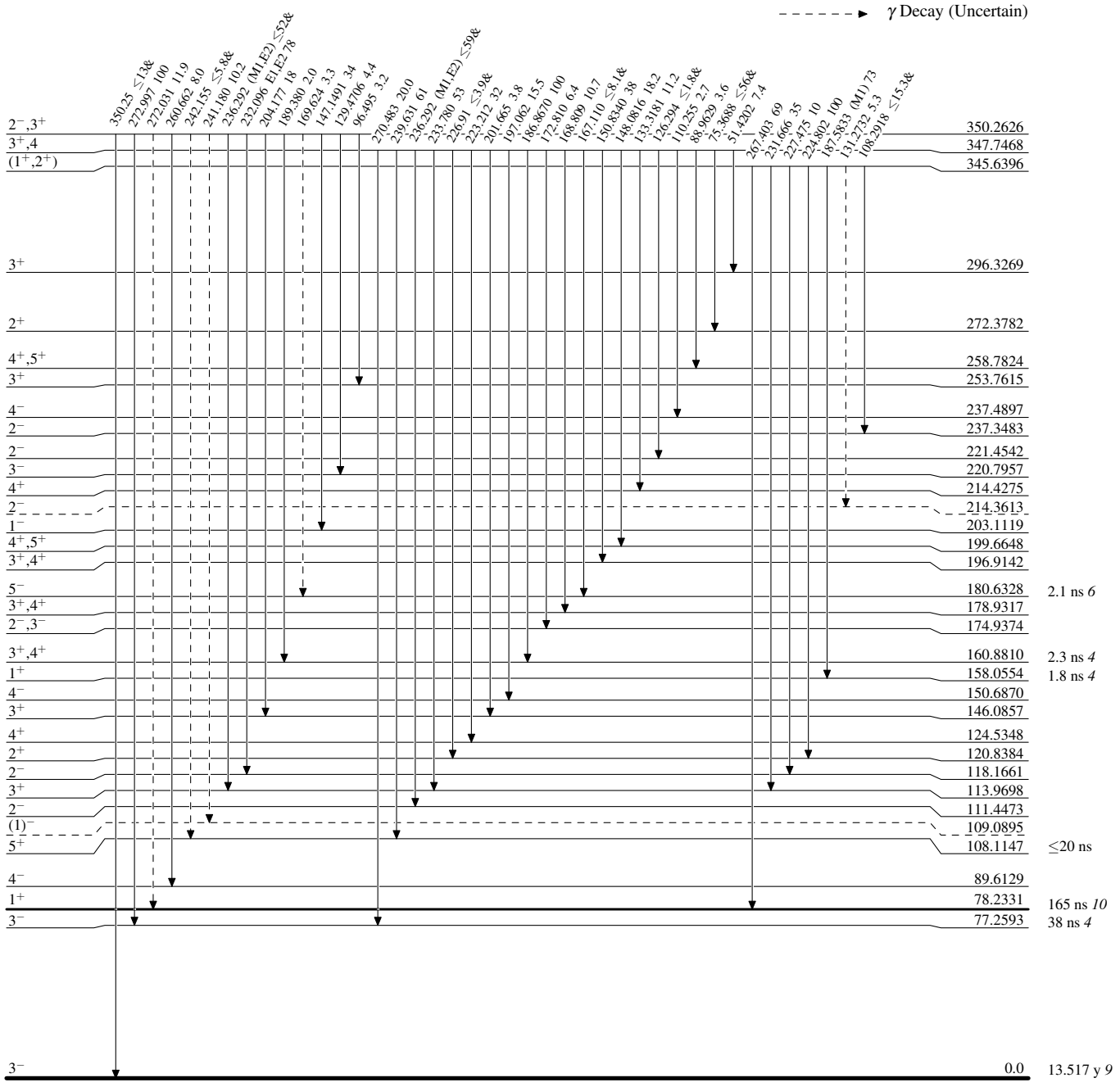
$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



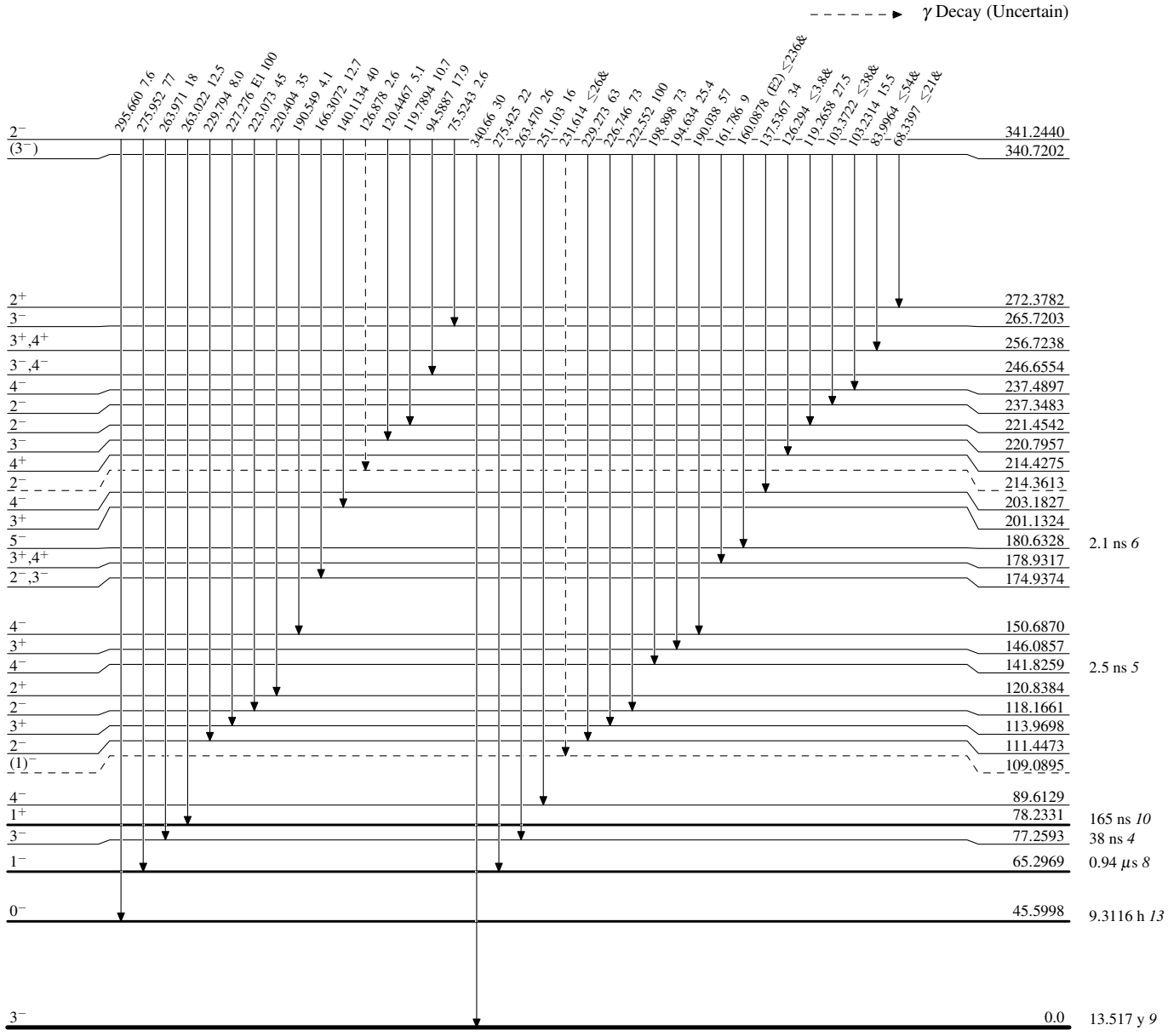
$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{152}_{63}Eu_{89}$

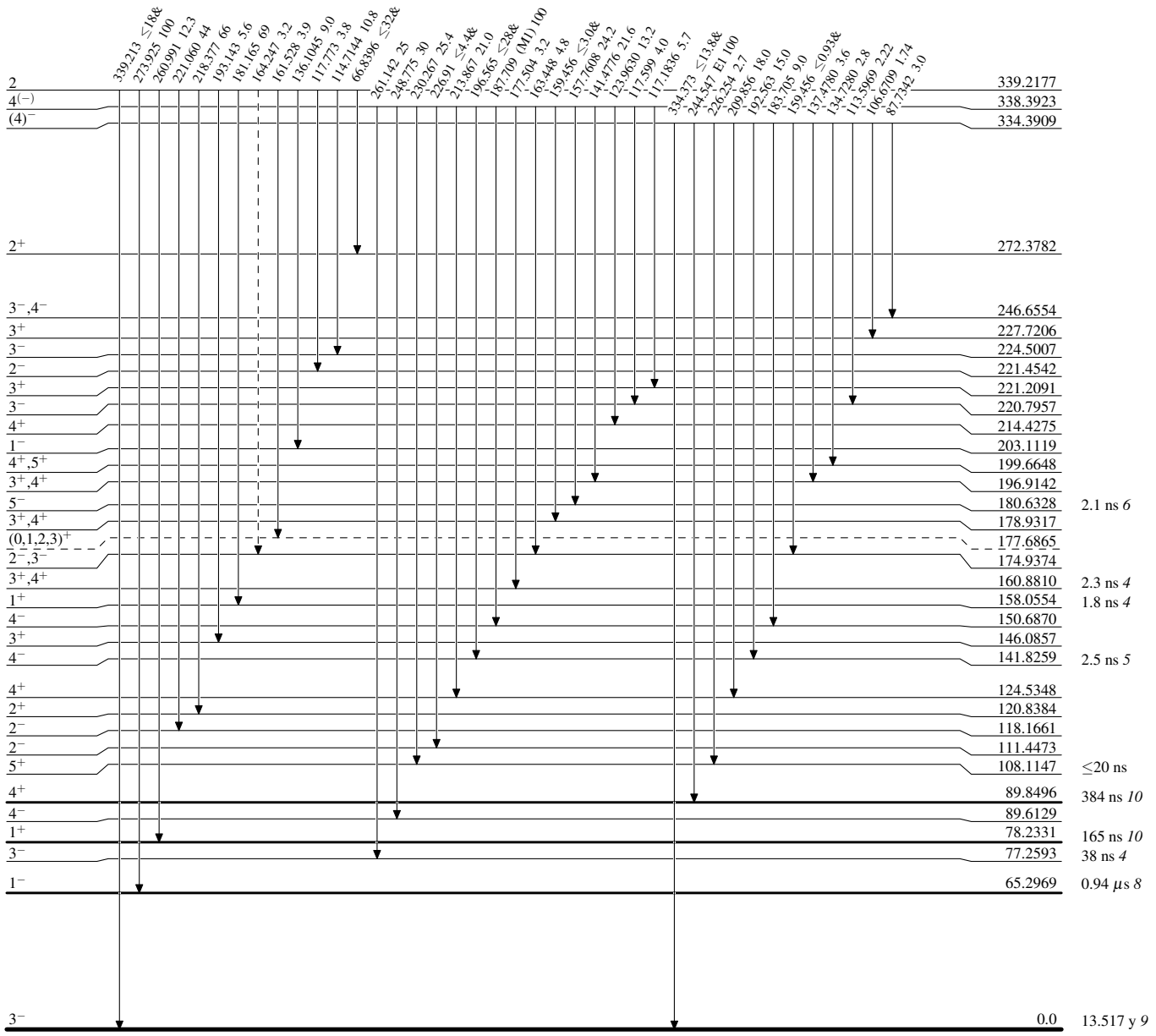
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

– – – – – – ► γ Decay (Uncertain)



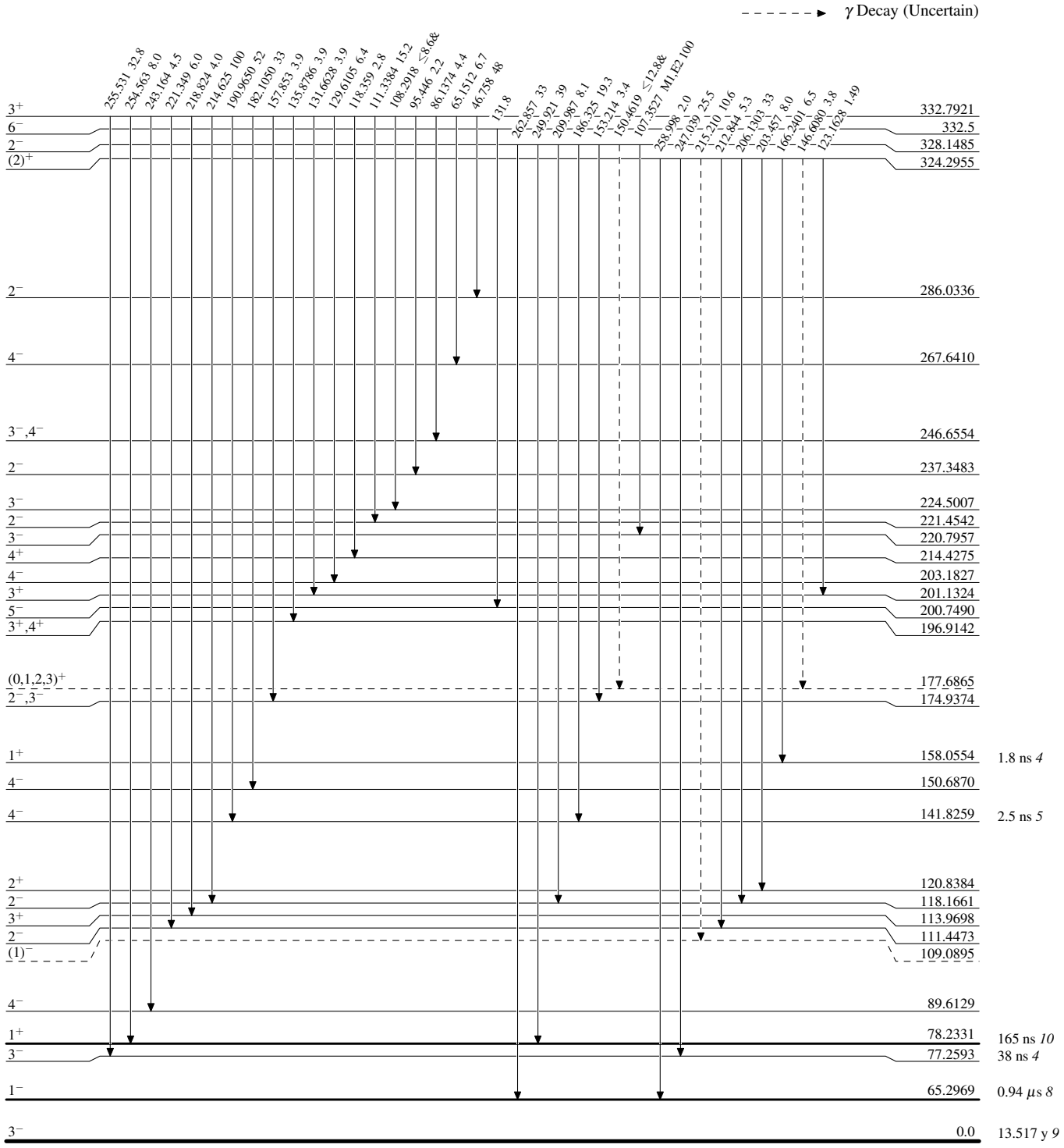
$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{152}_{63}Eu_{89}$

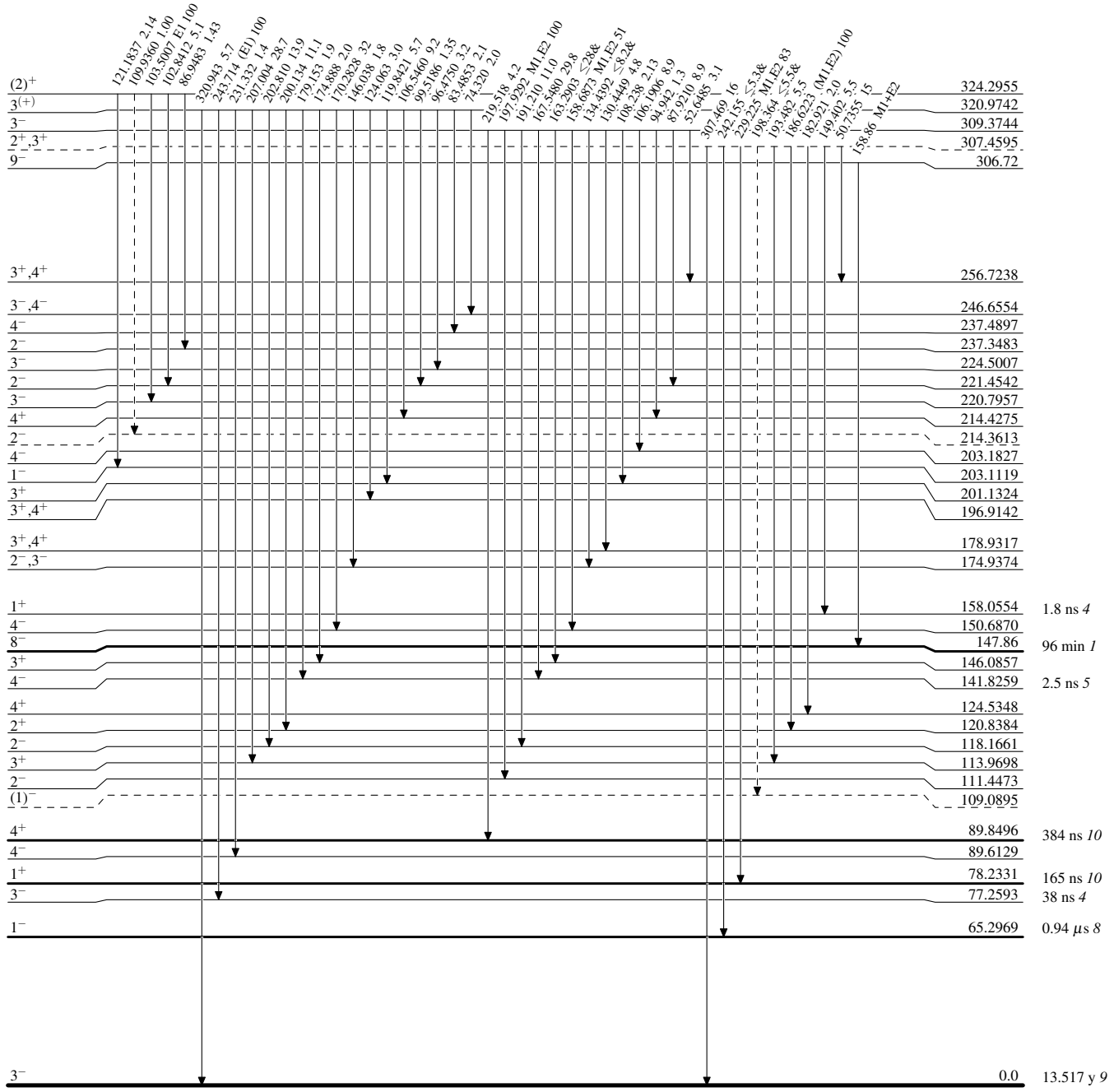
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

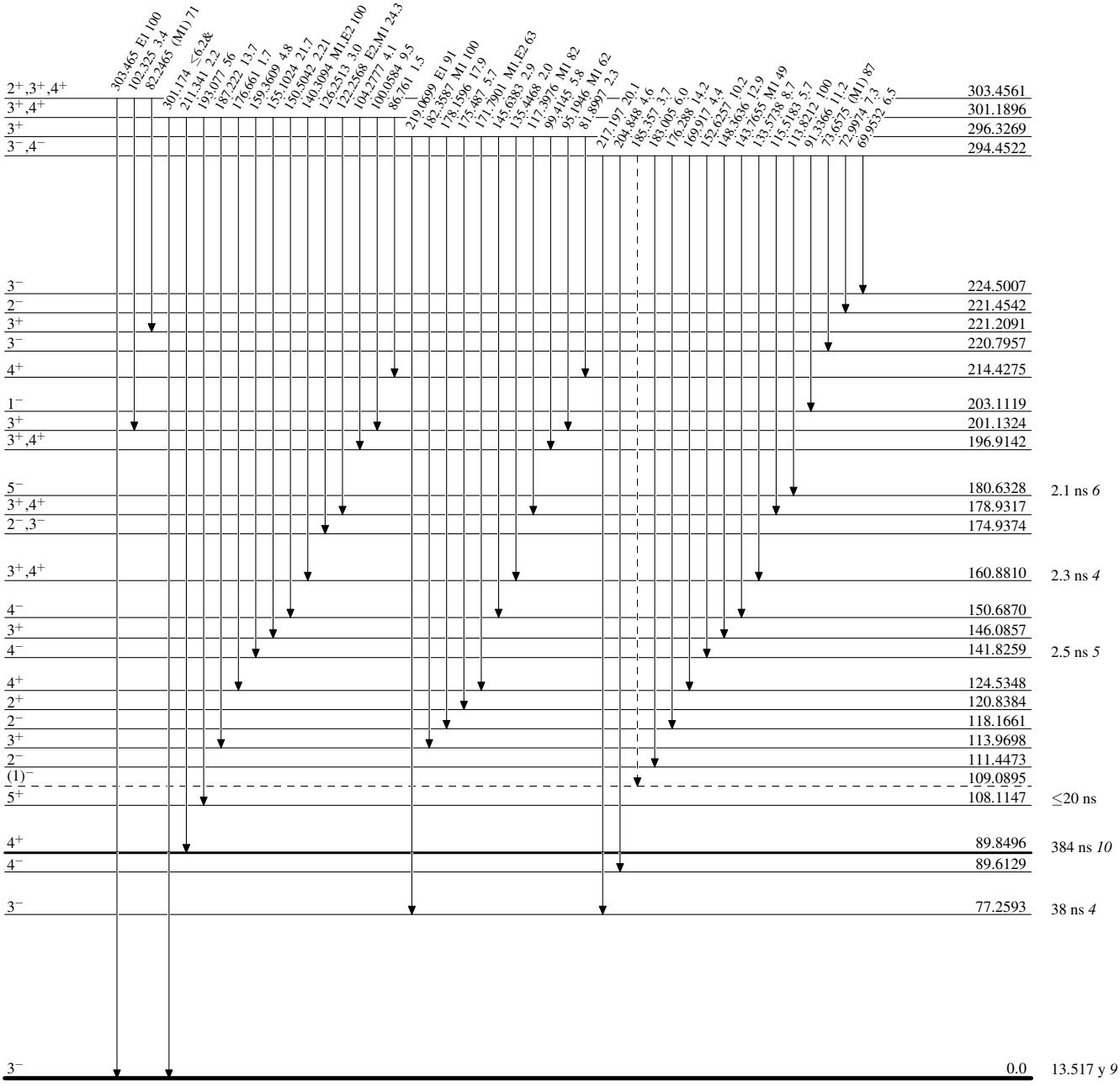
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

- - - - - - ► γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

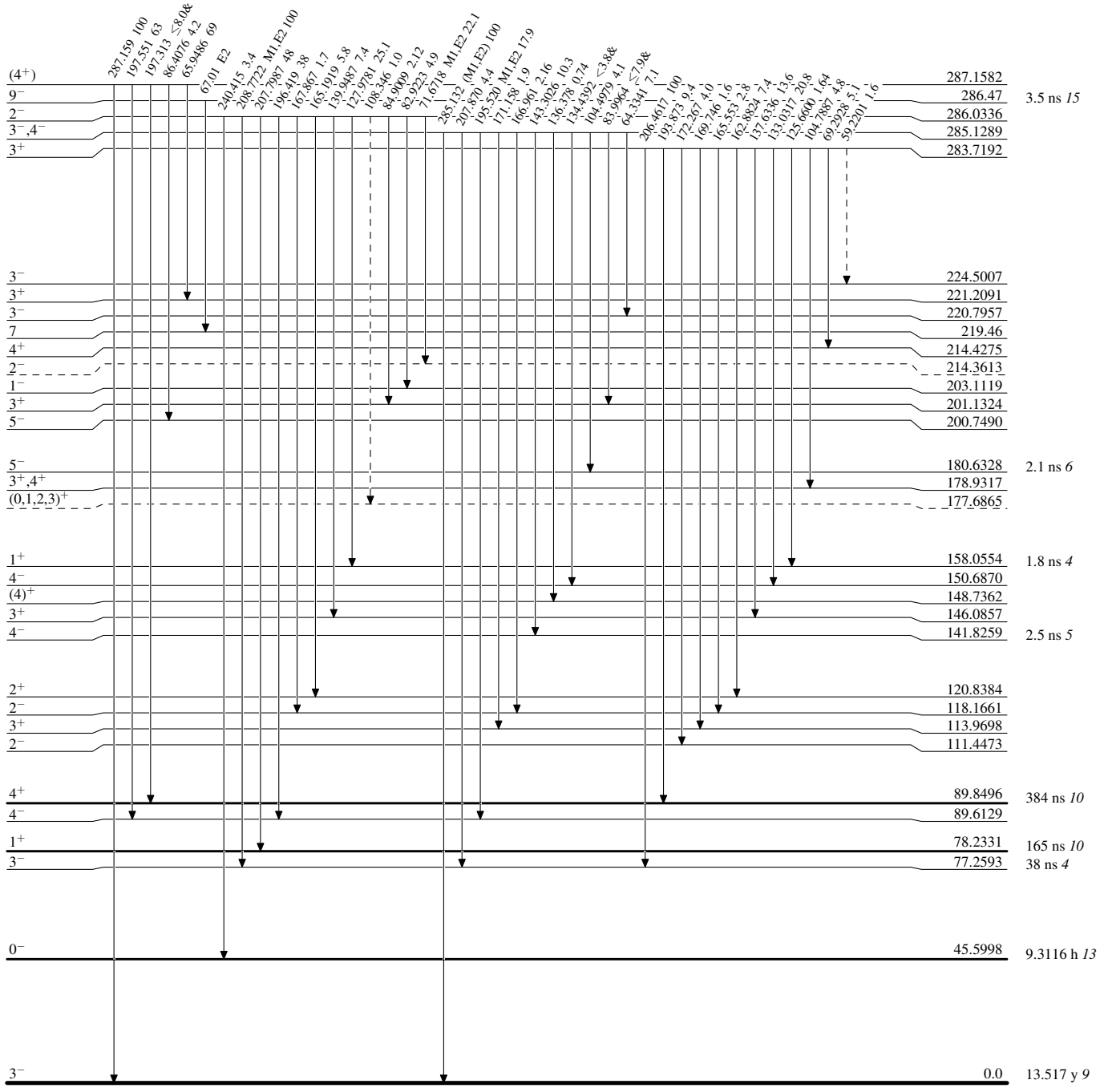
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)



$^{152}_{63}Eu_{89}$

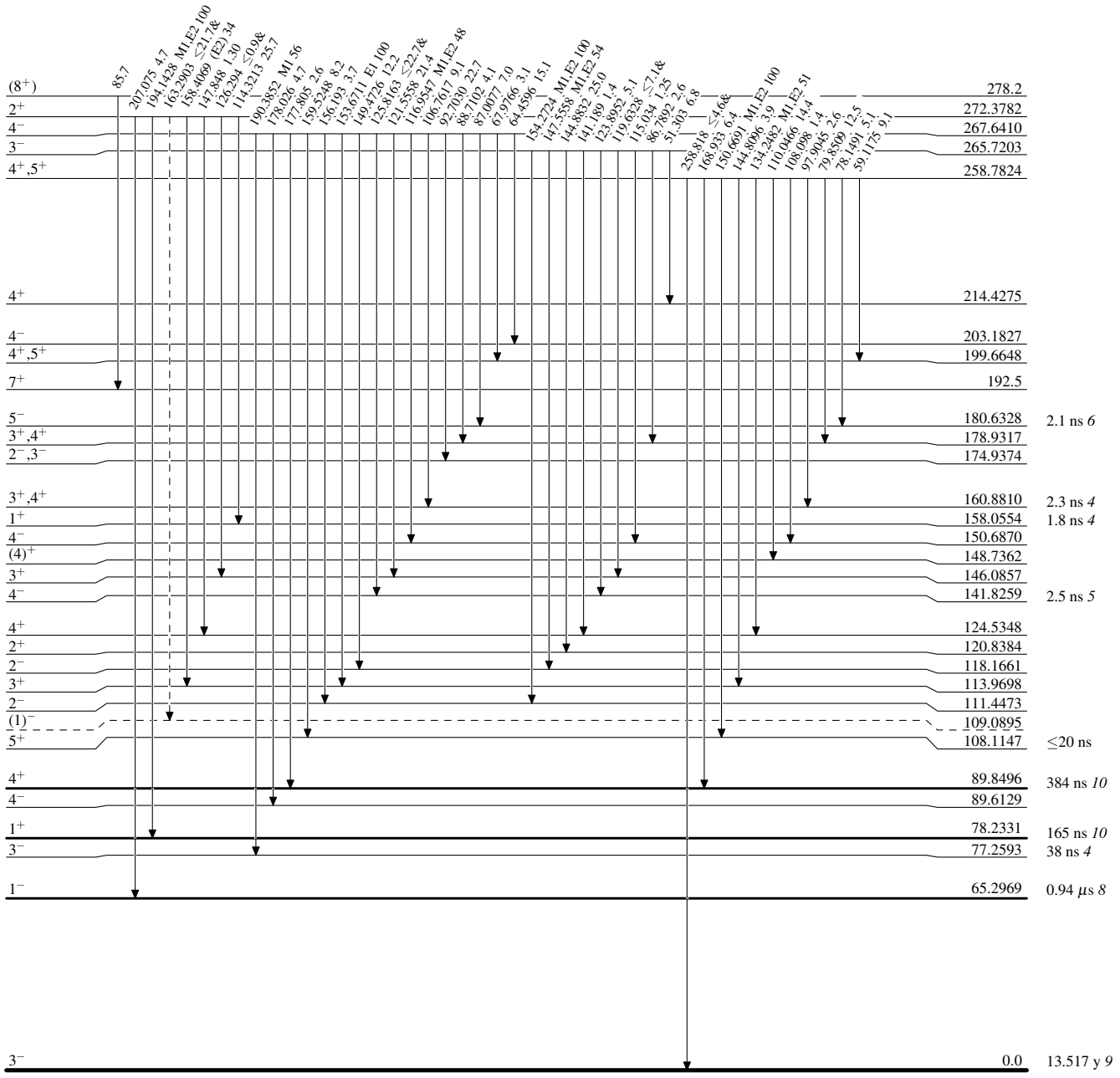
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

- - - - - - ► γ Decay (Uncertain)



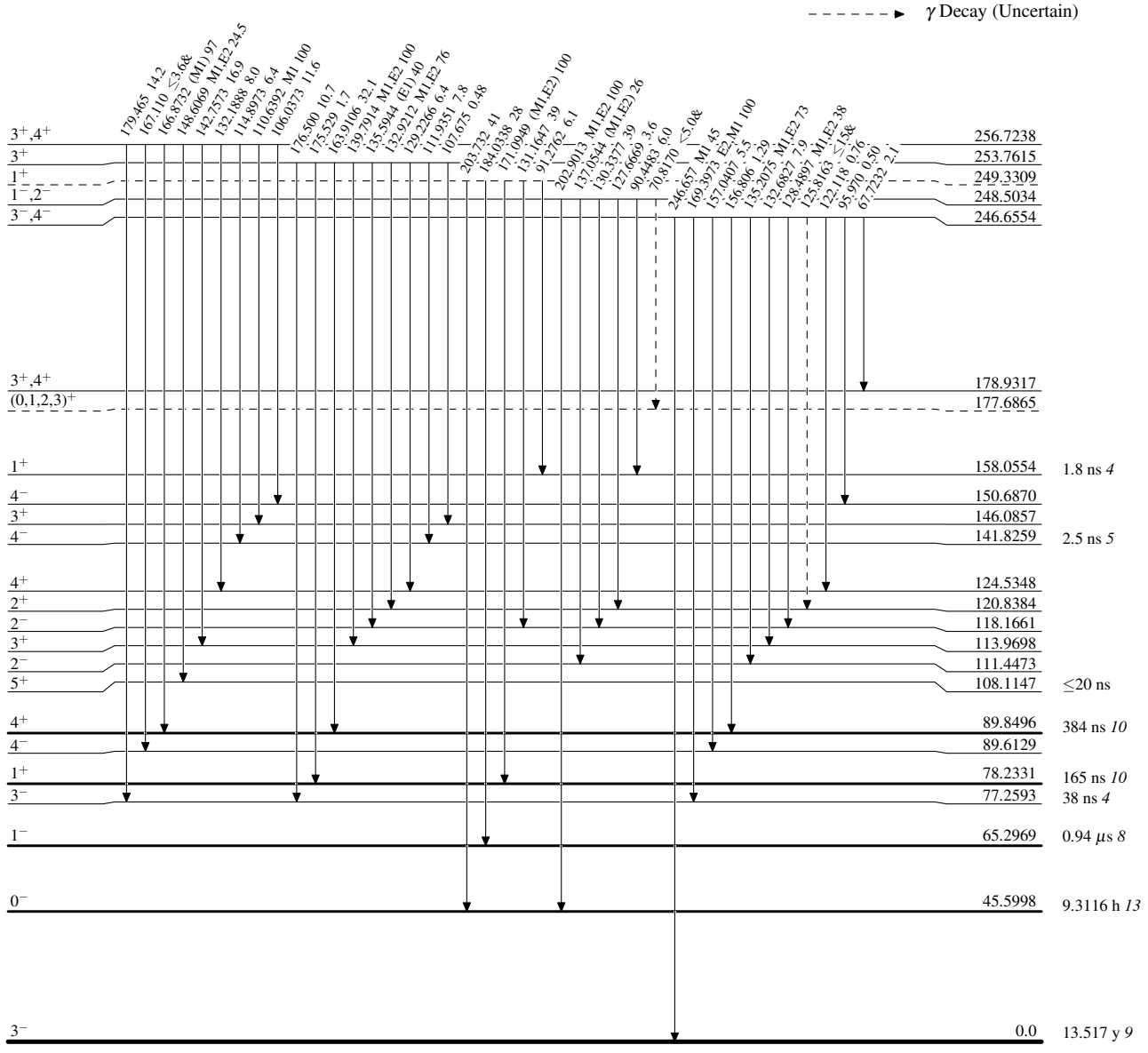
$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

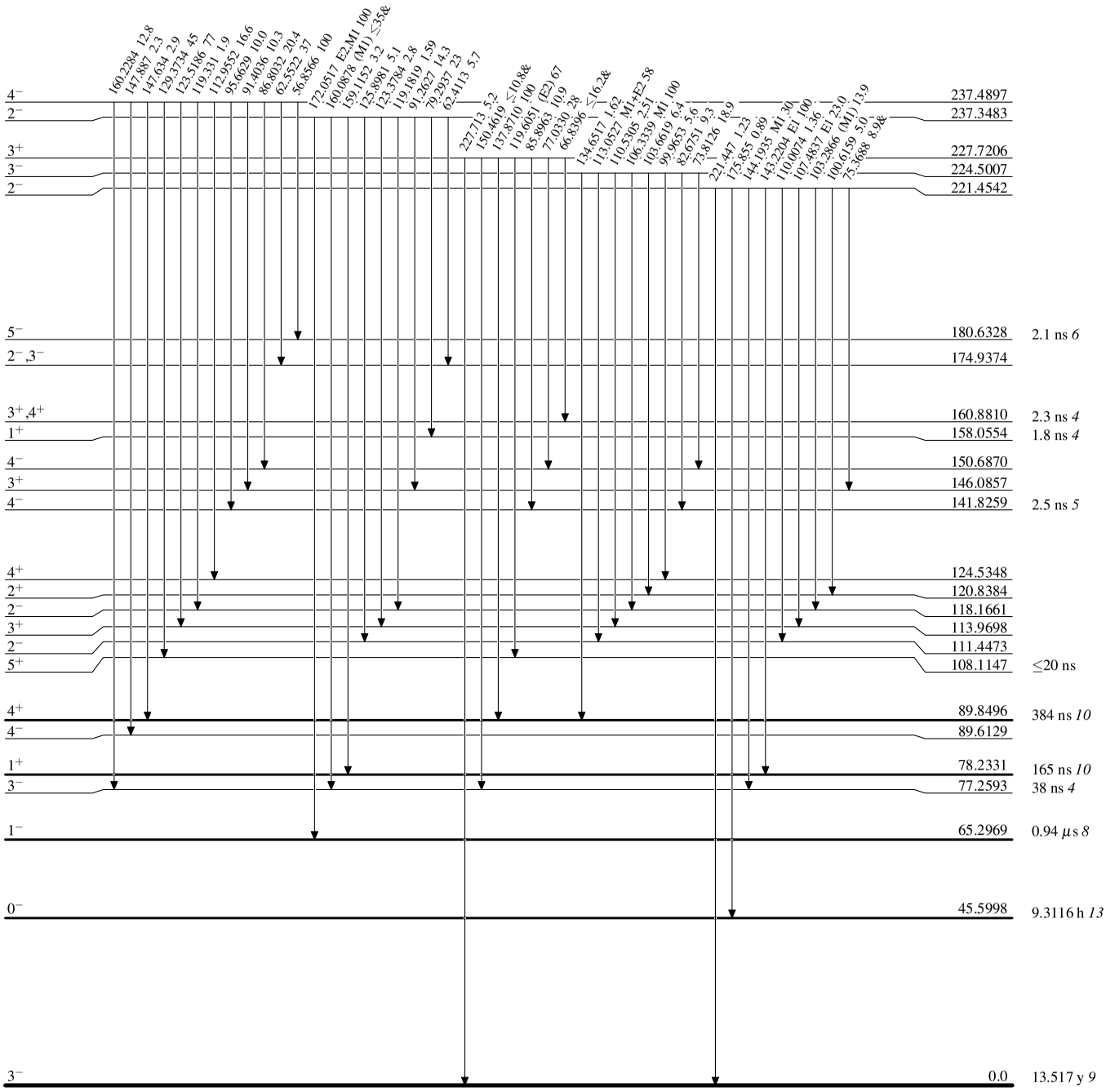


$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{152}_{63}Eu_{89}$

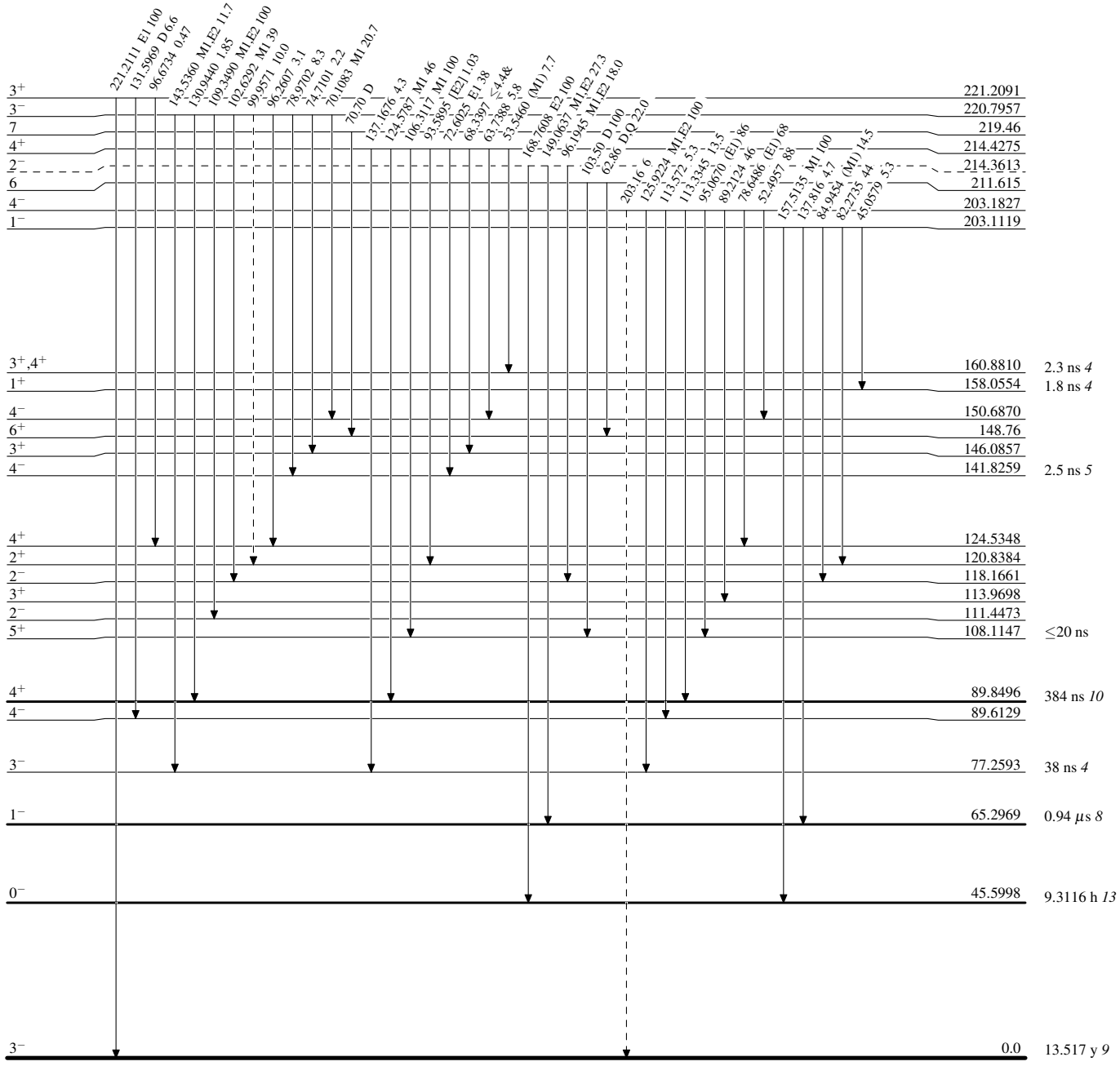
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)

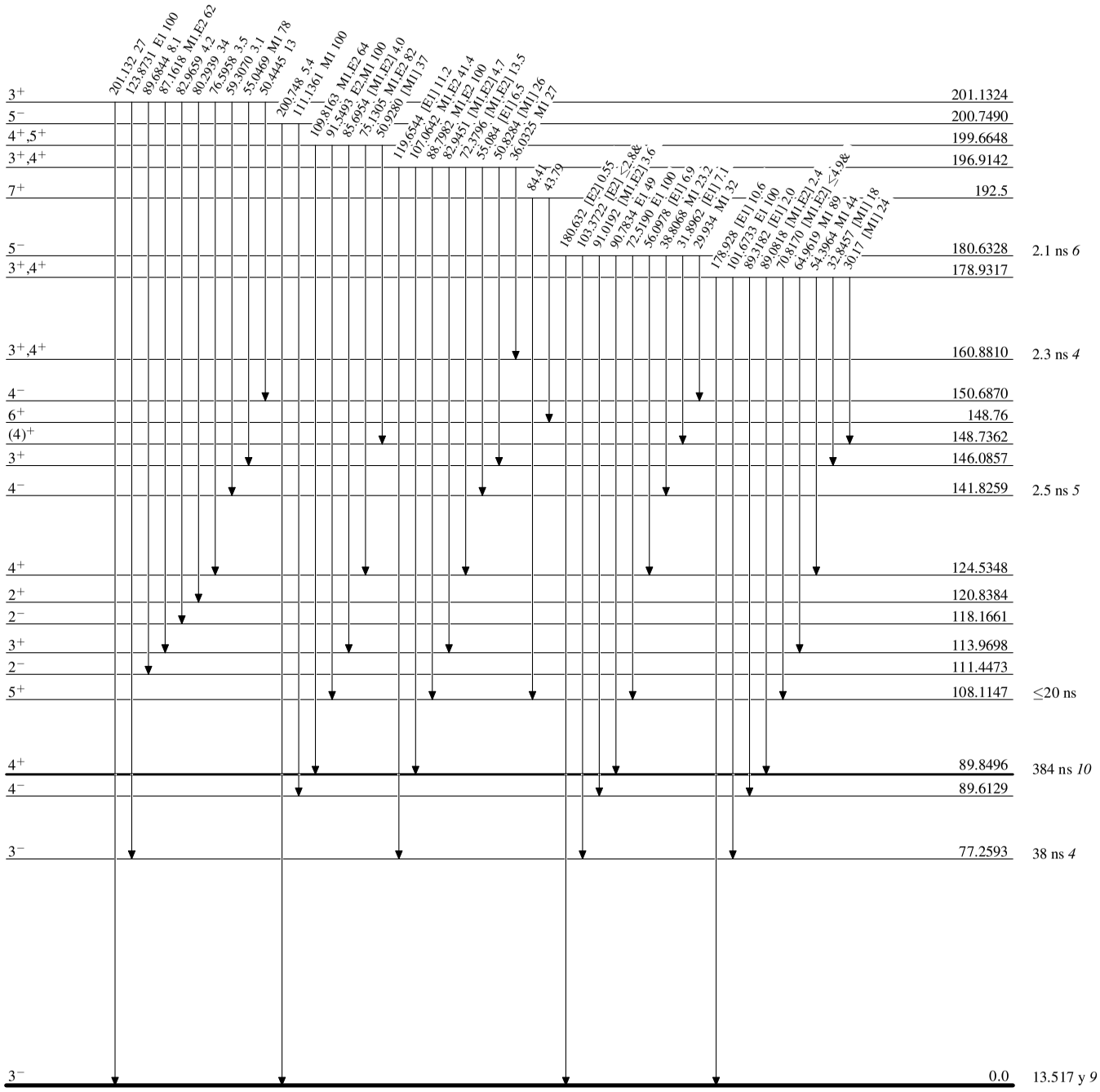


$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{152}_{63}Eu_{89}$

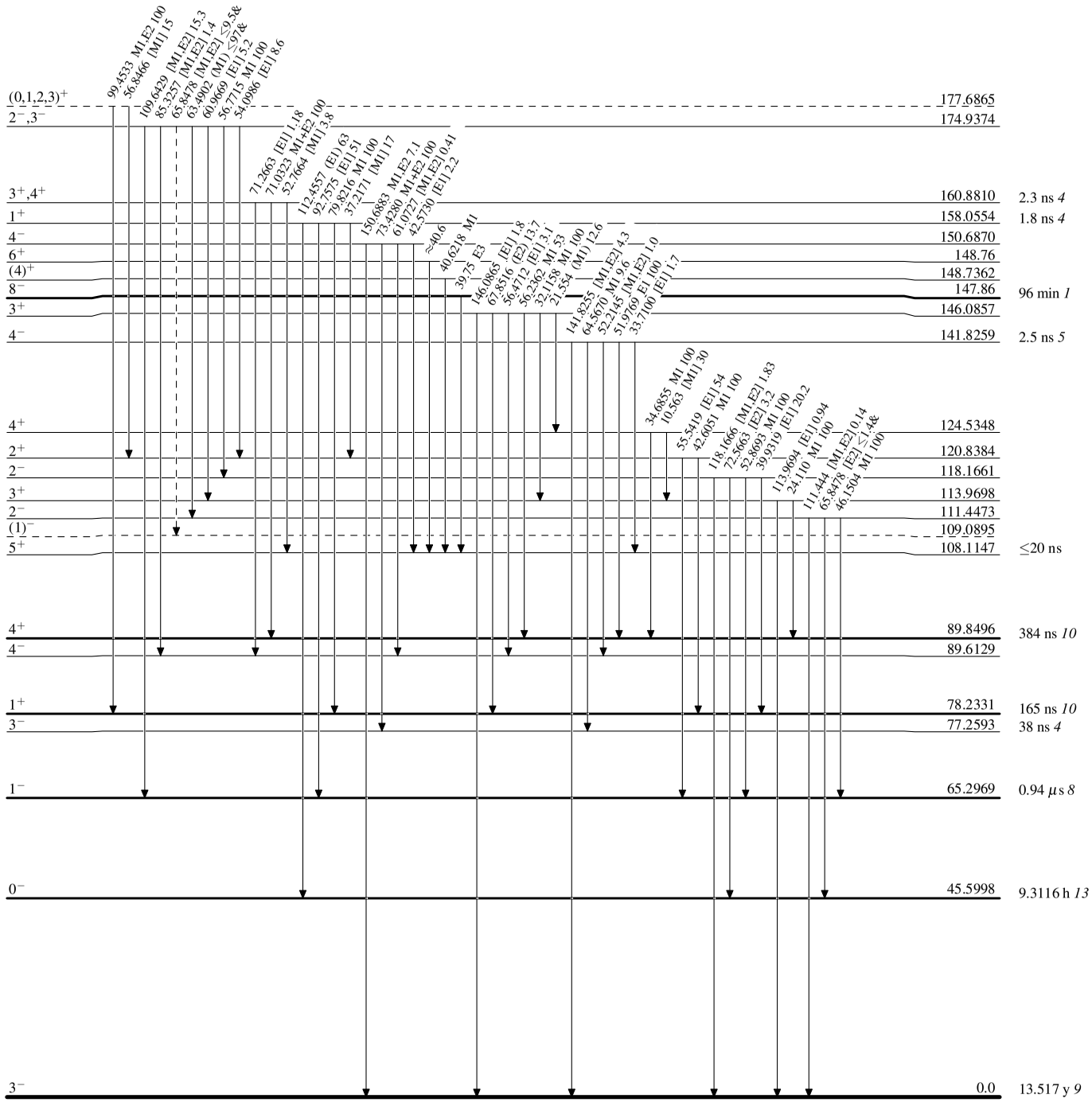
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

- - - - - - ► γ Decay (Uncertain)

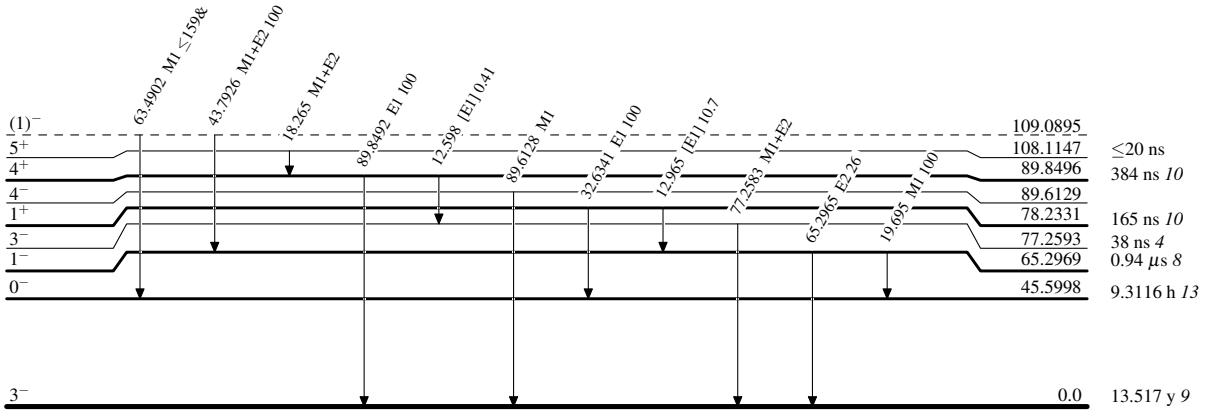


$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas

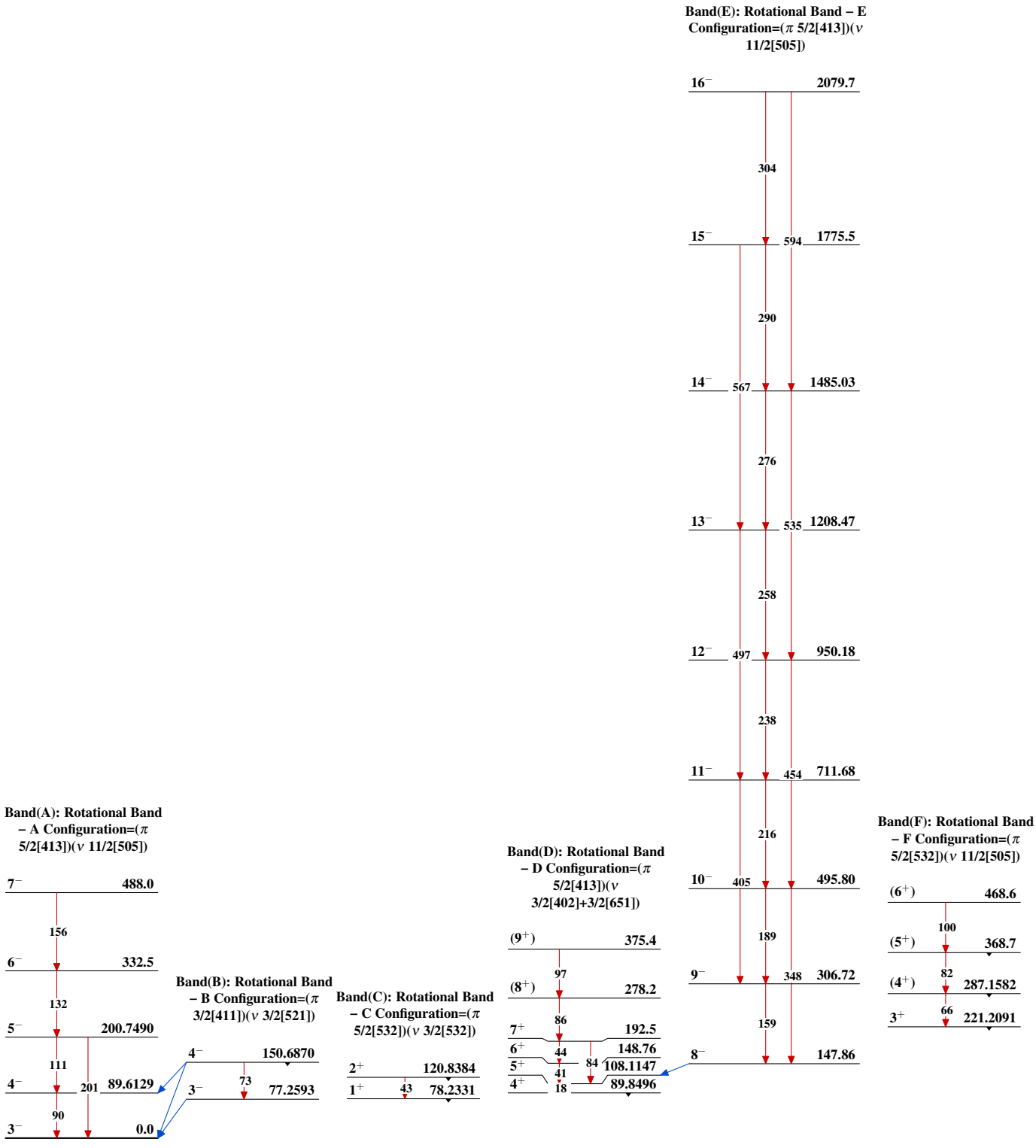
Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



$^{152}_{63}Eu_{89}$

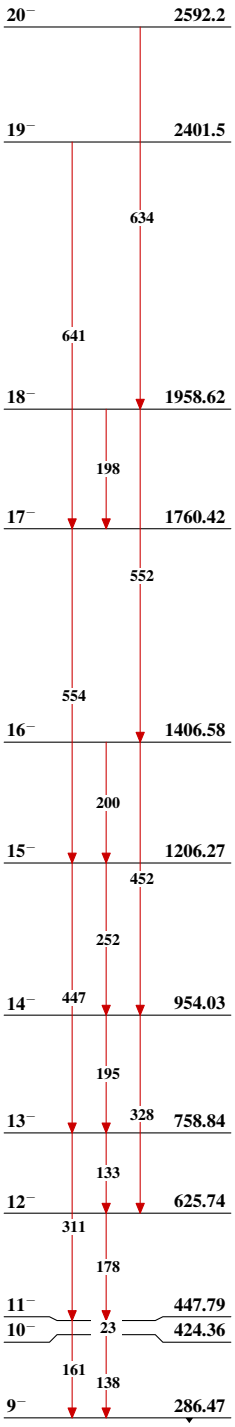
Adopted Levels, Gammas



$^{152}_{63}Eu_{89}$

Adopted Levels, Gammas (continued)

Band(G): Rotational Band – G
Configuration=(π 1h$_{11/2}$)(ν 1i$_{13/2}$)



$^{152}_{63}Eu_{89}$