Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 160, 1 (2019)	21-Oct-2019

Q(β^-)=251.8 *9*; S(n)=8151.3 *4*; S(p)=6651.9 *12*; Q(α)=−857 *5* 2017Wa10
S(2n)=14593.5 *4*; S(2p)=15748 *12* 2017Wa10
Additional information 1.

^{155}Eu Levels

A number of theoretical papers dealing with octupole correlations in nuclei in this mass region have appeared. Some of these relevant to ^{155}Eu include 1990Af03, 1990Sh46, 1993No01 and 1995Af01. 1990Af03 interpret the low-energy level scheme in terms of parity doublets and deduce a value for β_3. 1990Sh46 interpret the lowest 5/2±, 1/2± and 7/2± bands as parity doublets. 1993No01 conclude that the lowest 5/2± bands are not a parity doublet but allow the possibility that the lowest two sets of 1/2± bands may be such. 1995Af01 conclude that the features of the low-lying levels in ^{155}Eu can be accounted for without the need for assuming static reflection asymmetry. From (^{7}Li,α2nγ), 1998Ha27 examine the magnetic properties of the intraband transitions in the 5/2± bands and conclude that they do not constitute a parity doublet.

Cross Reference (XREF) Flags

A	^{155}Sm β^- decay	E	^{156}Gd(t,α),^{156}Gd(pol t,α)
B	^{154}Sm(^{7}Li,α2nγ)	F	^{154}Sm(^{3}He,d)
C	^{153}Eu(2n,γ)	G	^{154}Sm(^{3}He,pnγ)
D	^{154}Sm(α,t)	H	^{153}Eu(t,p)

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0‡	5/2$^+$	4.753 y *14*	ABCDEFGH	%β^-=100 μ=+1.520 *2*; Q=+2.5 *3* RMS charge radius <r^2>$^{1/2}$=5.1221 fm *69* (2013An02). T$_{1/2}$: computed from T$_{1/2}$=1736 d *5*, from the evaluation by Ch-Eg (2002) (for a discussion of this, see the comment in the ^{155}Eu β^- Decay data set). Value based on the following measurements: 1739 d *8* (1998Si12); 1735 d *22* (1993Th04); 1739 d *7* (1992Un01); 1737 d *23* (1983Wa26); 1708 d *18* (1974Da24); 1653 d *51* (1972Su09); and 1698 d *74* (1970Mo23). The uncertainty in the value of 1992Un01 (0.5 d) was increased to the point where it contributes no more than 50% to the total statistical weight. The value 1812 d *4* (1972Em01) was not included by Ch-Eg, based on statistical considerations. The recent value of 2002Un02, 1739.06 d *45*, is effectively the same as that of 1992Un01. In a subsequent review, 2004Wo02 propose T$_{1/2}$=1736 d *6*. J$^\pi$: L=0 in ^{153}Eu(t,p). J$^\pi$(^{153}Eu g.s.)=5/2$^+$. μ: From 2000Ga35 (LASER-induced resonance fluorescence in an atomic beam) and from 2014StZZ compilation. Other: +1.519 *10* (1999Ga36, same method as 2000Ga35); Q: From 1990Al34 (resonance cell lased spectroscopy, atomic beam) adopted in 2016St14 compilation. 1984Do11 report Δ<r^2>(^{155}Eu−^{151}Eu)=+0.677 fm^2 *33* from collinear LASER-ion beam spectroscopy. From LASER-induced resonance fluorescence in an atomic beam, 2002GaZV report Δ<r^2>(^{153}Eu,^{155}Eu)= 0.106 fm^2 *7* (see, also, 2002Ga49,2001Ga72). In their review paper, 1987Au06 give λ(^{155}Eu-^{151}Eu)=0.612 fm^2 *35* (where the nuclear parameter λ≈Δ<r^2>) and point out that the relative values of λ inferred for some of the Eu isotopes from the work of 1984Do11 partly disagree with other published data. 1990Al34 report λ(^{155}Eu-^{151}Eu)=0.650 fm^2 *7*. Others: 1986Al33, 1985Al06. In an evaluation of nuclear rms charge radii, 2004An14 report <r^2>$^{1/2}$=5.1221 fm *69*.

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Adopted Levels, Gammas (continued)

^{155}Eu Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$	XREF	Comments
78.638[‡] *1*	7/2$^+$		ABCDEFGH	J$^{\pi}$: M1+E2 transition to g.s. indicates J^{π}=3/2$^+$,5/2$^+$,7/2$^+$. The strong population of this level in (t,α) is characteristic of L=4 or 5, but not L=2, ruling out J^{π}=3/2$^+$ and 5/2$^+$.
104.334[#] *1*	5/2$^-$	0.104 ns *10*	ABCDEFG	μ=+9.6 *10* T$_{1/2}$: from βce(t) (1968Ma15). J$^{\pi}$: E1 transitions to 5/2$^+$ and 7/2$^+$ states indicate J^{π}=5/2$^-$ or 7/2$^-$. log *ft*=5.5 of β^- transition from ^{155}Sm (J^{π}=3/2$^-$) rules out 7/2. μ: From 2014StZZ.
169.009[#] *1*	7/2$^-$		ABCDEFG	J$^{\pi}$: E1 transitions to 5/2$^+$ and 7/2$^+$ states require J^{π}=5/2$^-$ or 7/2$^-$. Level-energy spacing and M1+E2 (intraband) transition support assignment as 7/2$^-$ member of the indicated rotational band.
179.157[‡] *1*	9/2$^+$		BCDE GH	J$^{\pi}$: E2 transition to 5/2$^+$ and M1+E2 transition to 7/2$^+$ consistent with J^{π}=9/2$^+$. Assignment as 9/2$^+$ member of g.s. band is supported by level-energy considerations and by population via L=2 transition in ^{153}Eu(t,p).
245.777[@] *1*	3/2$^+$	1.35 ns *5*	ABCDEfG	XREF: f(251). T$_{1/2}$: from $\beta\gamma$(t). Weighted average of: 1.35 ns *10* (1967Ko17); 1.38 ns *6* (1965Ma24); and 1.20 ns *15* (1961Ve04). J$^{\pi}$: M1 component in transition to 5/2$^+$, E2 transition to 7/2$^+$ state, and E1 transition to 5/2$^-$ state reveal that π=+ and J=3/2, 5/2 or 7/2. log *ft*=6.7 of β^- transition from ^{155}Sm (J^{π}=3/2$^-$) eliminates 7/2. $\gamma\gamma(\theta)$ results of 1985Be64 and 1971Be23 for the 141γ-104γ cascade are quite consistent with a 3/2(D,Q)5/2(D)5/2 sequence and are not consistent with 5/2, unless δ<−0.6 for the 141.4 γ. This is not possible according to RUL (see the comments on the 141.4428 γ).
254.665[#] *1*	9/2$^-$		BCDEfG	XREF: f(251). J$^{\pi}$: multipolarities of deexciting γ's indicate π=− and J=5/2, 7/2 or 9/2. γ to 9/2$^+$ level rules out J=5/2, and E2 to 5/2$^-$ level supports J=9/2. Level energy consistent with assignment as 9/2$^-$ member of the indicated band.
300.688[‡] *1*	11/2$^+$		BC GH	J$^{\pi}$: M1+E2 and E2 transitions, respectively, to the 9/2 and 7/2 members of the g.s. band, together with the observed energy spacing, indicate that this is the 11/2$^+$ member of the g.s. band. Its population in (t,p) is consistent with such an assignment.
307.383[@] *1*	5/2$^+$		ABCDEFG	J$^{\pi}$: excitation via L=2 transition in (^{3}He,d) indicates J^{π}=3/2$^+$ or 5/2$^+$. M1+E2 transition to 7/2$^+$ state rules out 3/2$^+$.
357.169[#] *1*	11/2$^-$		BCDEFG	J$^{\pi}$: L=5 in (^{3}He,d) indicates J^{π}=9/2$^-$ or 11/2$^-$. Analyzing power in (pol t,α) selects 11/2$^-$. Energy agrees well with that expected for 11/2$^-$ member of the indicated band.
391.484[@] *1*	7/2$^+$		ABCDEFG	J$^{\pi}$: E1 transitions to 5/2$^-$ and 9/2$^-$ states.
443.026[‡] *8*	13/2$^+$		BC G	J$^{\pi}$: E1 transition to 11/2$^-$ and E2 transition to 9/2$^+$. Level energy consistent with assignment as the 13/2$^+$ member of the g.s. band.
487.088[#] *1*	13/2$^-$		BCDE G	J$^{\pi}$: E2 transition and M1 transition to the 9/2$^-$ and 11/2$^-$ members, respectively, of the K^{π}=5/2$^-$ band, together with the level energy, indicate that this is the 13/2$^-$ member of the indicated band.
501.006[@] *1*	9/2$^+$		BCDEFG	J$^{\pi}$: L=4 transition in (^{3}He,d) indicates J^{π}=7/2$^+$ or 9/2$^+$. γ to 11/2$^-$ state rules out 7/2$^+$.
604.22[‡] *10*	15/2$^+$		B G	J$^{\pi}$: E2 γ to 11/2$^+$ and expected band structure.
624.22[#] *10*	15/2$^-$		B E G	J$^{\pi}$: E2 γ to 11/2$^-$ and expected band structure.
627.298[@] *1*	11/2$^+$		BC G	J$^{\pi}$: E1 to 9/2$^-$ and M1 to 9/2$^+$ indicate π=+ and J=7/2, 9/2 or 11/2. γ to 13/2$^-$ rules out J=7/2 and 9/2.
768.428[&] *3*	3/2$^-$		A C	J$^{\pi}$: E1 transitions to 3/2$^+$ and 5/2$^+$ states allow 3/2$^-$,5/2$^-$. Population of this and certain other higher-lying levels via primary transitions in neutron

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Adopted Levels, Gammas (continued)

^{155}Eu Levels (continued)

E(level)[†]	Jπ	XREF	Comments
			capture, the similarity of their γ-decay patterns, and their implied level spacings indicate that they form a K=3/2 band. From its position, this level would be the bandhead.
781.993[@] 4	13/2+	BC G	Jπ: M1 transition to 11/2+, E2 transition to 9/2+ and γ to 11/2−. Level-energy spacing suggests that this is the 13/2+ member of the indicated 3/2+ band.
785.22[‡] 14	17/2+	B G	Jπ: E1 γ to 15/2−, E2 to 13/2+, and expected band structure.
801.17[#] 12	(17/2−)	B	Jπ: γ's to 13/2−, 15/2− and 15/2+. Expected band structure.
817.669[&] 2	5/2−	A C	Jπ: E1 transitions to 3/2+ and 7/2+ states.
876.831[a] 4	(1/2)+	A C eF	XREF: e(878). Jπ: E1 from 3/2− level indicates π=+. 1986Pr03, from association of various ^{155}Eu states with the expected energy spacings within a 1/2[411] band, assign this state as the 1/2[411] bandhead.
881.689[&] 5	7/2−	C e	XREF: e(878). Jπ: E1 transitions to 5/2+ and 9/2+ states.
911.213[a] 4	3/2+	A CDEF	Jπ: population via L=2 transitions in (^{3}He,d) indicates J^π=3/2+ or 5/2+. The 3/2+ assignment is preferred because of the (^{3}He,d) cross section and the negative analyzing power in (pol t,α).
923.148[b] 5	1/2+	A C E	Jπ: E1 transition from 3/2− state indicates π=+. Assigned as the 1/2+ member of the 1/2[420] band largely because its (pol t,α) angular distribution is practically identical to those observed for such states in the near-lying nuclides ^{153}Pm, ^{157}Eu and ^{159}Eu.
944.37[@] 17	(15/2+)	B	Jπ: γ's to 11/2+, 13/2+ and 13/2−. Expected band structure.
956.350[b] 18	5/2+	CDEF	Jπ: M1 transitions to J^π=3/2+ and 7/2+ states. The hole-state nature of this level indicates that it is a member of the 1/2[420], rather than the 1/2[411], band.
967.16[#] 15	19/2−	B	Jπ: E2 γ to 15/2−, γ's to 17/2+ and (17/2−). Expected band structure.
973.992[&] 5	9/2−	C f	XREF: f(978). Jπ: E1 transition to 7/2+ and M1 to 11/2−.
977.198[c] 15	7/2+	CDEf	XREF: f(978). Jπ: M1 transition to g.s. indicates π=+. Strong population via L=4,5 transition in (^{3}He,d), together with the observed negative analyzing power in (pol t,α), identifies this as the 7/2[404] state.
979.474[d] 12	5/2+	C H	Jπ: E0 component in the transition to the g.s. Populated via L=0 transfer in ^{153}Eu(t,p).
982.58[‡] 19	19/2+	B	Jπ: E2 γ to 15/2+ and expected band structure.
1007.309[b] 6	3/2+	C E	XREF: E(1004). Jπ: M1 transition to 5/2+ level requires π=+. (pol t,α) cross section indicates L=2, with negative analyzing power indicating J=L−1/2, so the preferred assignment is J^π=3/2+.
1007.988 10	5/2−,7/2−	C	Jπ: M1 transitions to 5/2− and 7/2− states. Possible bandhead of 7/2[523] band (1986Pr03).
1022 3		DEF	
1053.631[a] 7	7/2+	Cd	XREF: d(1051). Jπ: M1 transitions to 5/2+ and 9/2+ states.
1054.838[d] 19	7/2+	Cd	XREF: d(1051). Jπ: E0 component in the transition to the 7/2+ member of the g.s. band.
1064.663[e] 16	(3/2)+	C f	XREF: f(1067). Jπ: M1 transition to g.s. indicates π=+. If there is an E0 component in the 818.8 transition (doubly placed) to the 3/2+ level, this would establish J^π=3/2+ and that this state is, at least in part, the β vibration built on 3/2[411].
1068.891[a] 6	5/2+	CD f H	XREF: f(1067). Jπ: populated via L=0 transfer in ^{153}Eu(t,p).
1078.064?[&] 14	(11/2−)	C	Jπ: γ's to 9/2+ and 13/2− states. Energy spacings suggest that this might be the 11/2− member of the indicated K^π=3/2− band.
1096.18 6	(3/2+,5/2+)	A C	Jπ: γ's to (1/2)+ and 7/2+ states.

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Adopted Levels, Gammas (continued)

^{155}Eu Levels (continued)

E(level)[†]	J$^\pi$	XREF	Comments
1101.670[f] *4*	3/2$^-$	A C	J$^\pi$: E1 transition to 1/2$^+$ state and M1,E2 transition to 7/2$^-$ state.
1106.799[f] *5*	3/2$^-$,5/2$^-$	A CdeF	XREF: d(1112)e(1109)F(1109). J$^\pi$: E1 transition to 3/2$^+$ state and M1 transition to 5/2$^-$ level indicate that J^π=3/2$^-$ or 5/2$^-$. 1986Pr03, on the basis of the total γ intensity out of the 1101 and 1106 levels and considerations of expected band structure, assign these levels as 3/2$^-$ and 1/2$^-$, respectively. This latter assignment would imply that the multipolarity, M1, reported by 1986Pr03 for the 1002.38 γ is incorrect.
1118 *3*		deF	XREF: d(1112)e(1109).
1126.26?[e] *3*	(5/2$^+$)	C	J$^\pi$: if there is an E0 component in the doubly placed 818.8 transition to the 5/2$^+$ level, this would establish J^π=5/2$^+$ and that this state is, at least in part, a member of the β vibration built on 3/2[411].
1132.029[b] *4*	(7/2)$^+$	C E	J$^\pi$: π=+ from M1 transition to 7/2$^+$ state. Negative analyzing power in (pol t,α), energy spacings within proposed band structure, and similarity to corresponding states in ^{157}Eu and ^{159}Eu suggest that this is the 7/2$^+$ member of the 1/2[420] band.
1138.389 *12*	7/2$^+$	C	J$^\pi$: E1 transition to 7/2$^-$ and M1 transition to 9/2$^+$ give J^π=7/2$^+$,9/2$^+$. γ to 5/2$^-$ rules out 9/2$^+$.
1140.3[@] *3*	(17/2$^+$)	B	J$^\pi$: γ's to 13/2$^+$, 15/2$^-$ and (15/2$^+$) levels. Expected band structure.
1151.41[d] *4*	9/2$^+$	C	J$^\pi$: γ's to the 7/2$^+$, 9/2$^+$ and 11/2$^+$ members of the g.s. band, together with a possible E0 component in the transition to that 9/2$^+$ state and the energy-level spacing, establish this as the 9/2$^+$ member of the indicated "β-vibrational" band.
1190.55[#] *17*	(21/2$^-$)	B	J$^\pi$: γ's to 19/2$^+$, 19/2$^-$, and (17/2$^-$). Expected band structure.
1193.79 *3*	7/2$^+$	CDE	XREF: E(1187). J$^\pi$: strength of primary capture γ ray to this level suggests π=+. γ's to 5/2$^-$ and 9/2$^-$ states then indicate J=7/2.
1198.09[‡] *21*	21/2$^+$	B	J$^\pi$: E2 γ to 17/2$^+$ and expected band structure.
1203 *3*	5/2$^-$,7/2$^-$	DEF	J$^\pi$: L=3 in (^{3}He,d).
1230.776[g] *25*	5/2$^+$	CDEF H	J$^\pi$: excited by L=0 transfer in ^{153}Eu(t,p). The strength with which this level is populated via L=2 transitions in stripping reactions indicates that it contains an appreciable fraction of the 5/2[402] state.
1264.045?[f] *9*	3/2$^-$,5/2$^-$	A C F	J$^\pi$: E1 transition to 3/2$^+$, M1 transition to 5/2$^-$. 1986Pr03 assign J^π=5/2$^-$ to this state from considerations of band structure.
1301.59 *5*	5/2,7/2$^+$	A C	J$^\pi$: transitions to 3/2$^+$, 7/2$^+$ and 7/2$^-$ states.
1315.94[g] *6*	(7/2$^+$)	C	J$^\pi$: 5/2$^-$,7/2,9/2$^-$ from γ's to 5/2$^-$ and 9/2$^-$ states. 1986Pr03 assign this as the 7/2$^+$ member of the 5/2[402] band.
1318	1/2$^-$,3/2$^-$	F	J$^\pi$: populated via L=1 transfer in (^{3}He,d).
1333.3[@] *4*	(19/2$^+$)	B	J$^\pi$: γ's to (15/2$^+$) and (17/2$^-$) and expected band structure.
≈1342		E	
≈1352		D	
1377 *3*	1/2$^-$,3/2$^-$	D F	XREF: D(1377?). J$^\pi$: populated via L=1 transfer in (^{3}He,d).
1380.14[#] *22*	23/2$^-$	B	J$^\pi$: E2 γ to 19/2$^-$ and expected band structure.
≈1400		D F	XREF: F(1402).
1421 *4*	11/2$^-$	E	J$^\pi$: from angular distribution of cross section and analyzing power in (pol t,α).
1427.2[‡] *3*	23/2$^+$	B	J$^\pi$: E2 γ to 19/2$^+$ and expected band structure.
1478 *3*	5/2$^+$	D H	J$^\pi$: populated via L=0 transfer in ^{153}Eu(t,p). The strength with which this level is populated via L=2 transitions in stripping reactions indicates that it contains an appreciable component of 5/2[402]. (Much of the remaining strength resides in the 1230.7 level.).
1483.04[h] *8*	3/2$^+$	C EF	XREF: E(1481). Population via L=2 transfer in (^{3}He,d) indicates π=+. Negative analyzing power in (pol t,α) yields J=3/2.
≈1515		DE	
≈1526		D	

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Adopted Levels, Gammas (continued)

^{155}Eu Levels (continued)

E(level)[†]	J^π	XREF	Comments
1548.58[h] *18*	(5/2+)	C E	J^π: energy spacing suggests this is the 5/2+ member of the 3/2[422] band.
1567.7[@] *6*	(21/2+)	B	J^π: γ to (17/2+) and expected band structure.
1632.56[h] *17*	7/2+	C E	J^π: from angular distribution of cross section and analyzing power in (pol t,α). Large 7/2+ (pol t,α) strength suggests this level is the 7/2+ member of the 3/2[422] band (1979Bu03).
1648.4?[#] *6*	(25/2−)	B	J^π: γ to (21/2−) and expected band structure.
1672.5[‡] *4*	25/2+	B	J^π: E2 γ to 21/2+ and expected band structure.
1736 *4*		E	
1785.9?[@] *6*	(23/2+)	B	J^π: γ to (19/2+) and expected band structure.
1820 *4*		E	
≈1845		E	
1929.2[‡] *6*	(27/2+)	B	J^π: γ to 23/2+ and expected band structure.
2198.7[‡] *6*	(29/2+)	B	J^π: γ to 25/2+ and expected band structure.

[†] In those instances where a level has been observed in the ^{153}Eu(2n,γ) reaction, the level energy from this reaction has been adopted.

[‡] Band(A): K^π=5/2+ band. Conf=5/2(413). A=11.29 keV, B=−4.7 eV and A_5=−22 milliev (from the 5/2+ through the 11/2+ levels). For the grouping of these levels according to the two signatures, see the ^{154}Sm(^{7}Li,α2nγ) data set.

[#] Band(B): K^π=5/2− band. Conf=5/2(532). A=9.18 keV, B=+8.3 eV and A_5=−0.30 eV (from the 5/2− through the 11/2− levels). This band is strongly Coriolis coupled with other bands based on states originating from the h11/2 proton spherical shell-model state and, hence, these band parameters are not expected to provide good values for the energies of the higher-lying band members. For the grouping of these levels according to the two signatures, see the ^{154}Sm(^{7}Li,α2nγ) data set.

[@] Band(C): K^π=3/2+ band. Conf=3/2(411). A=12.34 keV, B=−10.4 eV and A_3=+10. eV (from the 3/2+ through the 9/2+ levels). For the grouping of these levels according to the two signatures, see the ^{154}Sm(^{7}Li,α2nγ) data set.

[&] Band(D): K^π=3/2− band. K^π=0− octupole vibration built on 3/2[411]. A=9.65 keV, B=−3.5 eV and A_3=+36 eV (from the 3/2− through the 9/2− levels). Proposed as 3/2[541] by 1986Pr03 in ^{153}Eu(2n,γ). The evaluator has not adopted this, because: (1) the good agreement of the γ branching of the E1 transitions to the 3/2[411] band with the Alaga-rule predictions, which is expected for a K^π=0− octupole vibration, but not for a “single-particle” state; and (2) the relatively well-behaved energy spacings within the band, which should not occur for 3/2[541], because of the strong Coriolis mixing of this band with the other bands originating from the $h_{11/2}$ spherical shell-model state.

[a] Band(E): K^π=1/2+ band? configuration=1/2(411). The band structure given here is that proposed by 1986Pr03. The band parameters inferred for this band are highly anomalous and suggest that one or more of the levels is not correctly assigned. Further, the theoretical calculations presented in 1986Pr03 do not provide a good representation of the energies of the members of this band as assigned here.

[b] Band(F): K^π=1/2+ band. Conf=1/2(420). A=10.09 keV, B=−147 eV and a=+1.84. The large value of B indicates that the band is strongly distorted and that the listed band parameters are not likely to be able to provide a good estimate of the energies of the higher-lying band members.

[c] Band(G): K^π=7/2+ band. Conf=7/2(404).

[d] Band(H): K^π=5/2+ band. β−vibration built on 5/2[413]. A=10.30 keV, B=+15.3 eV.

[e] Band(I): K^π=3/2+ band? β−vibration built on 3/2[411]? A=12.30 keV.

[f] Band(J): K^π=1/2− band? Conf=1/2(550)? A=15.38 keV, a=−1.11.

[g] Band(K): K^π=5/2+ band. Dominant conf=5/2(402). A=12.17 keV. A significant fraction of the 5/2[402] strength is located elsewhere in the ^{155}Eu level scheme, suggesting that configurations other than simply 5/2[402] contribute to the makeup of this band.

[h] Band(L): K^π=3/2+ band. Conf=3/2(422)? A=12.74 keV, A_3=+61.9 eV. Alternatively, one computes A=13.86 keV and B=−93.9 eV (this latter value seems unrealistically large).

γ(^{155}Eu)

E$_i$(level)	J$_i^\pi$	E$_\gamma$†	I$_\gamma$†	E$_f$	J$_f^\pi$	Mult.‡	δ‡	α&	Comments
78.638	$7/2^+$	78.6379 *10*	100	0.0	$5/2^+$	M1+E2	0.641 *+29−28*	4.34 *8*	α(K)=2.83 *5*; α(L)=1.17 *5*; α(M)=0.269 *12* α(N)=0.060 *3*; α(O)=0.0085 *4*; α(P)=0.000290 *6* δ: from ^{153}Eu(2n,γ); other: 0.60 *8*, from ^{155}Sm β^- decay.
104.334	$5/2^-$	25.64 *6*	0.6 *1*	78.638	$7/2^+$	E1		2.07 *4*	B(E1)(W.u.)=0.00063 *13* α(L)=1.63 *3*; α(M)=0.355 *6* α(N)=0.0776 *12*; α(O)=0.01032 *16*; α(P)=0.000524 *8*
		104.3346 *8*	100 *5*	0.0	$5/2^+$	E1		0.253	B(E1)(W.u.)=0.00156 *19* α(K)=0.213 *3*; α(L)=0.0315 *5*; α(M)=0.00679 *10* α(N)=0.001529 *22*; α(O)=0.000230 *4*; α(P)=1.79×10^{-5} *3* δ: from $\gamma\gamma(\theta)$ in ^{155}Sm β^- decay, 1971Be23 report %E1=98.4 and %M2=6.0 for this transition. Although these two values cannot both be correct, it seems clear that %M2 is too large in any event. RUL<1 implies that δ<0.0012 for this transition.
169.009	$7/2^-$	64.6761 *6*	15.2 *16*	104.334	$5/2^-$	M1+E2	0.11 *+5−9*	6.56 *13*	α(K)=5.45 *9*; α(L)=0.87 *9*; α(M)=0.190 *21* α(N)=0.043 *5*; α(O)=0.0067 *6*; α(P)=0.000605 *10*
		90.3725 *17*	25.8 *10*	78.638	$7/2^+$	E1		0.373	α(K)=0.313 *5*; α(L)=0.0472 *7*; α(M)=0.01018 *15* α(N)=0.00229 *4*; α(O)=0.000342 *5*; α(P)=2.57×10^{-5} *4*
		169.0067 *9*	100 *6*	0.0	$5/2^+$	E1		0.0687	α(K)=0.0582 *9*; α(L)=0.00825 *12*; α(M)=0.001773 *25* α(N)=0.000401 *6*; α(O)=6.15×10^{-5} *9*; α(P)=5.21×10^{-6} *8*
179.157	$9/2^+$	100.5181 *11*	54.2 *14*	78.638	$7/2^+$	M1+E2	0.513 *25*	1.94	α(K)=1.459 *22*; α(L)=0.371 *13*; α(M)=0.084 *3* α(N)=0.0188 *7*; α(O)=0.00275 *9*; α(P)=0.000153 *3*
		179.1570 *6*	100 *6*	0.0	$5/2^+$	E2		0.312	α(K)=0.213 *3*; α(L)=0.0764 *11*; α(M)=0.01754 *25* α(N)=0.00392 *6*; α(O)=0.000552 *8*; α(P)=1.780×10^{-5} *25*
245.777	$3/2^+$	141.4428 *6*	57 *3*	104.334	$5/2^-$	E1		0.1110	B(E1)(W.u.)=1.93×10^{-5} *16* α(K)=0.0939 *14*; α(L)=0.01348 *19*; α(M)=0.00290 *4* α(N)=0.000655 *10*; α(O)=9.98×10^{-5} *14*; α(P)=8.21×10^{-6} *12* δ: from $\gamma\gamma(\theta)$, 1971Be23 report δ=0.18. This yields B(M2)=67 4, much larger than allowed by RUL. RUL<1 implies δ<0.015.
		167.1482 *11*	2.04 *15*	78.638	$7/2^+$	E2		0.395	B(E2)(W.u.)=0.73 *7* α(K)=0.264 *4*; α(L)=0.1020 *15*; α(M)=0.0235 *4* α(N)=0.00524 *8*; α(O)=0.000735 *11*; α(P)=2.16×10^{-5} *3*
		245.771 *4*	100 *7*	0.0	$5/2^+$	M1+E2	+0.281 *22*	0.1471	α(K)=0.1239 *18*; α(L)=0.0182 *3*; α(M)=0.00394 *6* α(N)=0.000901 *13*; α(O)=0.0001419 *20*; α(P)=1.349×10^{-5} *21* B(M1)(W.u.)=0.00056 *6*; B(E2)(W.u.)=0.38 *7* δ: from ^{155}Sm β^- decay (2004Ge20); other: 0.31 *3* (^{153}Eu(2n,γ),1986Pr03).
254.665	$9/2^-$	75.5091 *5*	5.5 *5*	179.157	$9/2^+$				
		85.6568 *4*	28.2 *17*	169.009	$7/2^-$	M1+E2	0.162 *+30−36*	2.92 *5*	α(K)=2.42 *4*; α(L)=0.391 *17*; α(M)=0.085 *4* α(N)=0.0195 *9*; α(O)=0.00302 *12*; α(P)=0.000266 *4*
		150.3292 *12*	3.2 *3*	104.334	$5/2^-$	E2		0.569	α(K)=0.364 *5*; α(L)=0.1597 *23*; α(M)=0.0369 *6* α(N)=0.00822 *12*; α(O)=0.001145 *16*; α(P)=2.91×10^{-5} *4*
		176.0262 *5*	100 *6*	78.638	$7/2^+$	E1		0.0616	α(K)=0.0522 *8*; α(L)=0.00738 *11*; α(M)=0.001586 *23* α(N)=0.000359 *5*; α(O)=5.51×10^{-5} *8*; α(P)=4.70×10^{-6} *7*

$\gamma(^{155}Eu)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α&	Comments
300.688	11/2+	121.5304 *8*	19.3 *19*	179.157	9/2+	M1+E2	0.56 *6*	1.092 *17*	α(K)=0.844 *15*; α(L)=0.193 *11*; α(M)=0.043 *3* α(N)=0.0098 *6*; α(O)=0.00145 *8*; α(P)=8.78×10^{-5} *22*
		222.046 *4*	100 *16*	78.638	7/2+	E2		0.1522	α(K)=0.1108 *16*; α(L)=0.0322 *5*; α(M)=0.00733 *11* α(N)=0.001641 *23*; α(O)=0.000235 *4*; α(P)=9.70×10^{-6} *14*
307.383	5/2+	61.6069 *3*	100 *5*	245.777	3/2+	M1(+E2)	0.050 *26*	7.49	α(K)=6.30 *9*; α(L)=0.93 *3*; α(M)=0.202 *7* α(N)=0.0462 *16*; α(O)=0.00729 *22*; α(P)=0.000701 *10* δ: other: 0.29 +*6*−*4*, from ^{155}Sm β^- decay.
		138.3746 *5*	39.0 *12*	169.009	7/2−	E1		0.1178	α(K)=0.0996 *14*; α(L)=0.01433 *20*; α(M)=0.00308 *5* α(N)=0.000696 *10*; α(O)=0.0001060 *15*; α(P)=8.69×10^{-6} *13*
		203.048 *3*	21 *2*	104.334	5/2−	E1		0.0421	α(K)=0.0357 *5*; α(L)=0.00500 *7*; α(M)=0.001075 *15* α(N)=0.000244 *4*; α(O)=3.76×10^{-5} *6*; α(P)=3.27×10^{-6} *5*
		228.7346 *18*	23.5 *17*	78.638	7/2+	M1+E2	1.0 +*4*−*3*	0.160 *8*	α(K)=0.128 *10*; α(L)=0.0252 *13*; α(M)=0.0056 *4* α(N)=0.00127 *7*; α(O)=0.000190 *8*; α(P)=1.30×10^{-5} *14*
		307.384 *9*	≤5	0.0	5/2+				
357.169	11/2−	102.5070 *7*	56.2 *20*	254.665	9/2−	M1(+E2)	0.00 *14*	1.72 *3*	α(K)=1.454 *22*; α(L)=0.208 *13*; α(M)=0.045 *3* α(N)=0.0103 *7*; α(O)=0.00163 *9*; α(P)=0.000161 *3*
		178.0092 *8*	100 *6*	179.157	9/2+	E1		0.0598	α(K)=0.0507 *7*; α(L)=0.00715 *10*; α(M)=0.001538 *22* α(N)=0.000348 *5*; α(O)=5.35×10^{-5} *8*; α(P)=4.56×10^{-6} *7*
		188.1601 *22*	15.2 *22*	169.009	7/2−	E2		0.264	α(K)=0.184 *3*; α(L)=0.0625 *9*; α(M)=0.01432 *20* α(N)=0.00320 *5*; α(O)=0.000453 *7*; α(P)=1.550×10^{-5} *22*
391.484	7/2+	84.1017 *10*	100 *4*	307.383	5/2+	M1+E2	0.113 +*25*−*31*	3.06	α(K)=2.56 *4*; α(L)=0.391 *13*; α(M)=0.085 *3* α(N)=0.0194 *7*; α(O)=0.00304 *9*; α(P)=0.000282 *4*
		136.8172 *11*	20 *1*	254.665	9/2−	E1		0.1215	α(K)=0.1027 *15*; α(L)=0.01479 *21*; α(M)=0.00318 *5* α(N)=0.000718 *10*; α(O)=0.0001093 *16*; α(P)=8.94×10^{-6} *13*
		145.7083 *21*	15.2 *6*	245.777	3/2+	E2		0.635	α(K)=0.399 *6*; α(L)=0.183 *3*; α(M)=0.0422 *6* α(N)=0.00940 *14*; α(O)=0.001306 *19*; α(P)=3.17×10^{-5} *5*
		212.284[b] *3*	25 *2*	179.157	9/2+				Mult.: see the comment in the ^{153}Eu(2n,γ) data set.
		222.4732 *24*	15 *2*	169.009	7/2−	E1		0.0331	α(K)=0.0281 *4*; α(L)=0.00391 *6*; α(M)=0.000841 *12* α(N)=0.000191 *3*; α(O)=2.95×10^{-5} *5*; α(P)=2.59×10^{-6} *4*
		287.146 *4*	25 *2*	104.334	5/2−	E1		0.01711	α(K)=0.01456 *21*; α(L)=0.00200 *3*; α(M)=0.000430 *6* α(N)=9.76×10^{-5} *14*; α(O)=1.518×10^{-5} *22*; α(P)=1.377×10^{-6} *20*
		312.929 *8*	2.3 *10*	78.638	7/2+				
		391.34 *3*	3.6 *7*	0.0	5/2+				
443.026	13/2+	85.8 *2*	14 *1*	357.169	11/2−	E1		0.429 *7*	α(K)=0.359 *6*; α(L)=0.0547 *9*; α(M)=0.01178 *19* α(N)=0.00265 *4*; α(O)=0.000394 *6*; α(P)=2.93×10^{-5} *5*
		142.4 *2*	12.9 *6*	300.688	11/2+	#	#		
		263.869 *8*	100 *5*	179.157	9/2+	E2		0.0871	α(K)=0.0658 *10*; α(L)=0.01660 *24*; α(M)=0.00375 *6* α(N)=0.000842 *12*; α(O)=0.0001224 *18*; α(P)=5.97×10^{-6} *9*

γ(^{155}Eu) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α&	Comments
487.088	13/2⁻	129.9192 *8*	100 *6*	357.169	11/2⁻	M1		0.876	α(K)=0.741 *11*; α(L)=0.1057 *15*; α(M)=0.0228 *4* α(N)=0.00523 *8*; α(O)=0.000829 *12*; α(P)=8.19×10^{-5} *12*
		186.3955 *25*	99 *9*	300.688	11/2⁺	E1		0.0529	α(K)=0.0448 *7*; α(L)=0.00631 *9*; α(M)=0.001356 *19* α(N)=0.000307 *5*; α(O)=4.72×10^{-5} *7*; α(P)=4.06×10^{-6} *6*
		232.466 *13*	70 *11*	254.665	9/2⁻	E2		0.1310	α(K)=0.0964 *14*; α(L)=0.0269 *4*; α(M)=0.00612 *9* α(N)=0.001371 *20*; α(O)=0.000197 *3*; α(P)=8.52×10^{-6} *12*
501.006	9/2⁺	109.5219 *3*	100 *5*	391.484	7/2⁺	M1(+E2)	0.08 *6*	1.425 *21*	α(K)=1.202 *18*; α(L)=0.175 *7*; α(M)=0.0379 *16* α(N)=0.0087 *4*; α(O)=0.00137 *5*; α(P)=0.0001328 *21*
		143.8349 *18*	13.0 *8*	357.169	11/2⁻				
		193.6233 *16*	37 *4*	307.383	5/2⁺	E2		0.240	α(K)=0.1683 *24*; α(L)=0.0556 *8*; α(M)=0.01273 *18* α(N)=0.00285 *4*; α(O)=0.000404 *6*; α(P)=1.429×10^{-5} *20*
		332.017 *4*	38 *3*	169.009	7/2⁻	E1		0.01189	α(K)=0.01013 *15*; α(L)=0.001382 *20*; α(M)=0.000297 *5* α(N)=6.75×10^{-5} *10*; α(O)=1.052×10^{-5} *15*; α(P)=9.69×10^{-7} *14*
		422.078 *13*	8.6 *13*	78.638	7/2⁺	M1		0.0360	α(K)=0.0306 *5*; α(L)=0.00423 *6*; α(M)=0.000912 *13* α(N)=0.000209 *3*; α(O)=3.32×10^{-5} *5*; α(P)=3.33×10^{-6} *5*
604.22	15/2⁺	117.5 *2*	9.6 *8*	487.088	13/2⁻	#	#		
		161.1 *2*	10.7 *8*	443.026	13/2⁺	#	#		
		303.6 *2*	100 *6*	300.688	11/2⁺	E2		0.0561	α(K)=0.0434 *7*; α(L)=0.00992 *14*; α(M)=0.00223 *4* α(N)=0.000501 *8*; α(O)=7.36×10^{-5} *11*; α(P)=4.04×10^{-6} *6*
624.22	15/2⁻	137.1 *2*	100 *5*	487.088	13/2⁻	#	#		
		181.3 *2*	95 *5*	443.026	13/2⁺	E1		0.0569	α(K)=0.0483 *7*; α(L)=0.00681 *10*; α(M)=0.001463 *21* α(N)=0.000331 *5*; α(O)=5.09×10^{-5} *8*; α(P)=4.36×10^{-6} *7*
		266.9 *2*	94 *5*	357.169	11/2⁻	E2		0.0840	α(K)=0.0635 *9*; α(L)=0.01591 *23*; α(M)=0.00359 *6* α(N)=0.000807 *12*; α(O)=0.0001173 *17*; α(P)=5.78×10^{-6} *9*
627.298	11/2⁺	126.2917 *10*	40 *7*	501.006	9/2⁺	M1		0.949	α(K)=0.803 *12*; α(L)=0.1145 *16*; α(M)=0.0247 *4* α(N)=0.00567 *8*; α(O)=0.000899 *13*; α(P)=8.88×10^{-5} *13*
		140.204 *9*	3.8 *12*	487.088	13/2⁻				
		235.7 *5*	52 *8*	391.484	7/2⁺	[E2]		0.1252 *20*	α(K)=0.0924 *15*; α(L)=0.0255 *5*; α(M)=0.00579 *10* α(N)=0.001299 *22*; α(O)=0.000187 *3*; α(P)=8.20×10^{-6} *13* E_γ,I_γ: from (^{7}Li,α2nγ). The main part of this γ in ^{153}Eu(2n,γ) is placed in ^{154}Eu. Iγ value computed by the evaluator from Iγ(235.7γ)/Iγ(372.1γ) in (^{7}Li,α2nγ) and Iγ(372.667γ).
		372.667 *7*	100 *10*	254.665	9/2⁻	E1		0.00896	α(K)=0.00765 *11*; α(L)=0.001037 *15*; α(M)=0.000222 *4* α(N)=5.06×10^{-5} *7*; α(O)=7.91×10^{-6} *11*; α(P)=7.37×10^{-7} *11*
		448.3[b] *2*	5 *2*	179.157	9/2⁺				
768.428	3/2⁻	461.046 *11*	53 *6*	307.383	5/2⁺	E1		0.00543	α(K)=0.00463 *7*; α(L)=0.000622 *9*; α(M)=0.0001333 *19* α(N)=3.04×10^{-5} *5*; α(O)=4.77×10^{-6} *7*; α(P)=4.52×10^{-7} *7*
		522.670 *4*	100 *6*	245.777	3/2⁺	E1		0.00408	α(K)=0.00349 *5*; α(L)=0.000466 *7*; α(M)=9.98×10^{-5} *14* α(N)=2.27×10^{-5} *4*; α(O)=3.58×10^{-6} *5*; α(P)=3.43×10^{-7} *5*
		664.122 *7*	30 *4*	104.334	5/2⁻	M1+E2	−0.231 *21*	0.0112	δ: from ^{155}Sm β^- decay (2004Ge20).

Adopted Levels, Gammas (continued)

γ(^{155}Eu) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[&]	Comments
768.428	3/2⁻	768.27 *7*	3.7 *13*	0.0	5/2⁺				
781.993	13/2⁺	154.698[a] *4*	92[a] *22*	627.298	11/2⁺	M1		0.536	α(K)=0.454 *7*; α(L)=0.0645 *9*; α(M)=0.01394 *20* α(N)=0.00319 *5*; α(O)=0.000506 *7*; α(P)=5.01×10^{-5} *7*
		280.940 *13*	100 *38*	501.006	9/2⁺	(E2)		0.0714	α(K)=0.0545 *8*; α(L)=0.01315 *19*; α(M)=0.00296 *5* α(N)=0.000666 *10*; α(O)=9.72×10^{-5} *14*; α(P)=5.01×10^{-6} *7*
		424.844 *18*	84 *18*	357.169	11/2⁻	#	#		
785.22	17/2⁺	160.8 *2*	22 *1*	624.22	15/2⁻	E1		0.0785	α(K)=0.0665 *10*; α(L)=0.00946 *14*; α(M)=0.00203 *3* α(N)=0.000460 *7*; α(O)=7.04×10^{-5} *11*; α(P)=5.92×10^{-6} *9*
		181.0 *5*	9.0 *7*	604.22	15/2⁺	#	#		
		342.3 *2*	100 *3*	443.026	13/2⁺	E2		0.0390	α(K)=0.0307 *5*; α(L)=0.00650 *10*; α(M)=0.001452 *21* α(N)=0.000327 *5*; α(O)=4.85×10^{-5} *7*; α(P)=2.91×10^{-6} *5*
801.17	(17/2⁻)	177.1 *2*	100 *5*	624.22	15/2⁻				
		196.8 *2*	55 *3*	604.22	15/2⁺				
		314.1 *2*	85 *4*	487.088	13/2⁻				
817.669	5/2⁻	426.177 *3*	78 *6*	391.484	7/2⁺	E1		0.00651	α(K)=0.00556 *8*; α(L)=0.000749 *11*; α(M)=0.0001606 *23* α(N)=3.66×10^{-5} *6*; α(O)=5.73×10^{-6} *8*; α(P)=5.41×10^{-7} *8*
		510.296 *3*	100 *8*	307.383	5/2⁺	E1		0.00431	α(K)=0.00368 *6*; α(L)=0.000492 *7*; α(M)=0.0001054 *15* α(N)=2.40×10^{-5} *4*; α(O)=3.77×10^{-6} *6*; α(P)=3.61×10^{-7} *5*
		571.885 *4*	80 *4*	245.777	3/2⁺	E1		0.00335	α(K)=0.00286 *4*; α(L)=0.000381 *6*; α(M)=8.15×10^{-5} *12* α(N)=1.86×10^{-5} *3*; α(O)=2.93×10^{-6} *4*; α(P)=2.82×10^{-7} *4*
		648.56 *6*	31 *6*	169.009	7/2⁻	M1		0.01216	α(K)=0.01036 *15*; α(L)=0.001412 *20*; α(M)=0.000304 *5* α(N)=6.95×10^{-5} *10*; α(O)=1.107×10^{-5} *16*; α(P)=1.119×10^{-6} *16*
		713.31 *5*	31 *3*	104.334	5/2⁻	M1		0.00961	α(K)=0.00820 *12*; α(L)=0.001113 *16*; α(M)=0.000239 *4* α(N)=5.48×10^{-5} *8*; α(O)=8.73×10^{-6} *13*; α(P)=8.84×10^{-7} *13*
		817.61 *4*	9.8 *10*	0.0	5/2⁺				
876.831	(1/2)⁺	631.023[a] *4*	100[a] *9*	245.777	3/2⁺				
		880 *10*	16 *3*	0.0	5/2⁺				
881.689	7/2⁻	380.670 *8*	51 *5*	501.006	9/2⁺	E1		0.00852	α(K)=0.00727 *11*; α(L)=0.000984 *14*; α(M)=0.000211 *3* α(N)=4.81×10^{-5} *7*; α(O)=7.52×10^{-6} *11*; α(P)=7.01×10^{-7} *10*
		490.327 *15*	21 *3*	391.484	7/2⁺	E1		0.00471	α(K)=0.00403 *6*; α(L)=0.000539 *8*; α(M)=0.0001155 *17* α(N)=2.63×10^{-5} *4*; α(O)=4.13×10^{-6} *6*; α(P)=3.94×10^{-7} *6*
		574.277 *9*	100 *10*	307.383	5/2⁺	E1		0.00332	α(K)=0.00284 *4*; α(L)=0.000377 *6*; α(M)=8.07×10^{-5} *12* α(N)=1.84×10^{-5} *3*; α(O)=2.90×10^{-6} *4*; α(P)=2.80×10^{-7} *4*
		627.021 *10*	30 *2*	254.665	9/2⁻	M1		0.01322	α(K)=0.01127 *16*; α(L)=0.001537 *22*; α(M)=0.000330 *5* α(N)=7.57×10^{-5} *11*; α(O)=1.205×10^{-5} *17*; α(P)=1.218×10^{-6} *17*
		712.7 *2*	16 *3*	169.009	7/2⁻				
911.213	3/2⁺	142.814 *4*	7.7 *9*	768.428	3/2⁻				
		603.806 *9*	100 *7*	307.383	5/2⁺	M1		0.01452	α(K)=0.01237 *18*; α(L)=0.001690 *24*; α(M)=0.000363 *5* α(N)=8.33×10^{-5} *12*; α(O)=1.325×10^{-5} *19*; α(P)=1.339×10^{-6} *19*
		665.423 *5*	60 *5*	245.777	3/2⁺	M1		0.01141	α(K)=0.00972 *14*; α(L)=0.001324 *19*; α(M)=0.000285 *4* α(N)=6.52×10^{-5} *10*; α(O)=1.038×10^{-5} *15*; α(P)=1.050×10^{-6} *15*

$^{155}_{63}Eu_{92}$-9

γ(^{155}Eu) (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[†]	E_f	J^{π}_f	Mult.[‡]	α[&]	Comments
911.213	3/2+	830 *20*	8.3 *17*	78.638	7/2+			
		911	8.3 *17*	0.0	5/2+			
923.148	1/2+	154.698[ab] *4*	7.6[a] *18*	768.428	3/2−			
		677.406[a] *6*	100[a] *8*	245.777	3/2+			
		923.08[b] *3*	21 *3*	0.0	5/2+			
944.37	(15/2+)	161.9 *5*	48 *6*	781.993	13/2+			
		317.1 *2*	100 *9*	627.298	11/2+			
		457.1 *5*	56 *6*	487.088	13/2−			
956.350	5/2+	564.831 *22*	95 *7*	391.484	7/2+	M1	0.01716	α(K)=0.01461 *21*; α(L)=0.00200 *3*; α(M)=0.000430 *6* α(N)=9.86×10^{-5} *14*; α(O)=1.569×10^{-5} *22*; α(P)=1.583×10^{-6} *23*
		648.88 *7*	100 *12*	307.383	5/2+	M1	0.01214	α(K)=0.01035 *15*; α(L)=0.001410 *20*; α(M)=0.000303 *5* α(N)=6.95×10^{-5} *10*; α(O)=1.106×10^{-5} *16*; α(P)=1.118×10^{-6} *16*
		710.65 *3*	37 *4*	245.777	3/2+	M1,E2	0.0076 *21*	α(K)=0.0065 *19*; α(L)=0.00092 *21*; α(M)=0.00020 *5* α(N)=4.6×10^{-5} *10*; α(O)=7.2×10^{-6} *17*; α(P)=6.8×10^{-7} *21*
967.16	19/2−	165.9 *2*	57 *3*	801.17	(17/2−)			
		181.6 *5*	18 *2*	785.22	17/2+	#		
		342.9 *2*	100 *5*	624.22	15/2−	E2	0.0388	α(K)=0.0305 *5*; α(L)=0.00646 *10*; α(M)=0.001443 *21* α(N)=0.000325 *5*; α(O)=4.82×10^{-5} *7*; α(P)=2.90×10^{-6} *4*
973.992	9/2−	346.705 *6*	20.7 *14*	627.298	11/2+			
		472.841 *17*	41 *6*	501.006	9/2+	E1	0.00512	α(K)=0.00437 *7*; α(L)=0.000586 *9*; α(M)=0.0001257 *18* α(N)=2.86×10^{-5} *4*; α(O)=4.50×10^{-6} *7*; α(P)=4.28×10^{-7} *6*
		582.519 *9*	100 *9*	391.484	7/2+	E1	0.00322	α(K)=0.00275 *4*; α(L)=0.000365 *6*; α(M)=7.82×10^{-5} *11* α(N)=1.784×10^{-5} *25*; α(O)=2.81×10^{-6} *4*; α(P)=2.72×10^{-7} *4*
		616.825 *21*	20.4 *20*	357.169	11/2−	M1	0.01377	α(K)=0.01173 *17*; α(L)=0.001601 *23*; α(M)=0.000344 *5* α(N)=7.89×10^{-5} *11*; α(O)=1.256×10^{-5} *18*; α(P)=1.269×10^{-6} *18*
		719.34 *10*	8.7 *20*	254.665	9/2−			
977.198	7/2+	898.455 *20*	43 *3*	78.638	7/2+	M1,E2	0.0044 *11*	α(K)=0.00373 *96*; α(L)=0.00052 *12*; α(M)=0.000112 *24* α(N)=2.6×10^{-5} *6*; α(O)=4.0×10^{-6} *10*; α(P)=3.9×10^{-7} *11*
		977.331 *23*	100 *5*	0.0	5/2+	M1	0.00448	α(K)=0.00383 *6*; α(L)=0.000514 *8*; α(M)=0.0001104 *16* α(N)=2.53×10^{-5} *4*; α(O)=4.03×10^{-6} *6*; α(P)=4.11×10^{-7} *6*
979.474	5/2+	672.09 *5*	7.4 *15*	307.383	5/2+			
		800.21 *6*	26 *3*	179.157	9/2+			
		900.847 *16*	79 *9*	78.638	7/2+	M1	0.00545	α(K)=0.00465 *7*; α(L)=0.000627 *9*; α(M)=0.0001346 *19* α(N)=3.08×10^{-5} *5*; α(O)=4.91×10^{-6} *7*; α(P)=5.00×10^{-7} *7*
		979.463 *17*	100 *4*	0.0	5/2+	E0+(M1)+E2	0.0036[@] *9*	α(K)=0.0031 *8*; α(L)=0.00042 *9*; α(M)=9.1×10^{-5} *20* α(N)=2.1×10^{-5} *5*; α(O)=3.3×10^{-6} *8*; α(P)=3.23×10^{-7} *86*
982.58	19/2+	181.7 *5*	8.5 *4*	801.17	(17/2−)	#		
		197.0 *5*	9.3 *4*	785.22	17/2+	#		
		378.3 *2*	100 *4*	604.22	15/2+	E2	0.0290	α(K)=0.0231 *4*; α(L)=0.00463 *7*; α(M)=0.001030 *15* α(N)=0.000232 *4*; α(O)=3.47×10^{-5} *5*; α(P)=2.23×10^{-6} *4*

$\gamma(^{155}Eu)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[&]	Comments
1007.309	3/2+	699.939 7	100 7	307.383	5/2+	M1		0.01007	α(K)=0.00859 12; α(L)=0.001167 17; α(M)=0.000251 4 α(N)=5.75×10⁻⁵ 8; α(O)=9.15×10⁻⁶ 13; α(P)=9.26×10⁻⁷ 13
		761.504[a] 10	75[a] 7	245.777	3/2+				
1007.988	5/2−,7/2−	838.88 4	42 3	169.009	7/2−	M1,E2		0.0051 14	α(K)=0.0044 12; α(L)=0.00061 14; α(M)=0.00013 3 α(N)=3.0×10⁻⁵ 7; α(O)=4.8×10⁻⁶ 11; α(P)=4.6×10⁻⁷ 14
		903.654 10	100 9	104.334	5/2−	M1		0.00541	α(K)=0.00462 7; α(L)=0.000622 9; α(M)=0.0001336 19 α(N)=3.06×10⁻⁵ 5; α(O)=4.88×10⁻⁶ 7; α(P)=4.96×10⁻⁷ 7
		929.24 8	25 12	78.638	7/2+				
		1008.03 3	63 4	0.0	5/2+	E1		1.07×10⁻³	α(K)=0.000916 13; α(L)=0.0001186 17; α(M)=2.53×10⁻⁵ 4 α(N)=5.79×10⁻⁶ 9; α(O)=9.17×10⁻⁷ 13; α(P)=9.16×10⁻⁸ 13
1053.631	7/2+	171.940[b] 5	5.7 9	881.689	7/2−				Mult.: see the comment in the ¹⁵³Eu(2n,γ) data set.
		552.625 10	88 6	501.006	9/2+	M1,E2		0.0142 40	α(K)=0.0120 35; α(L)=0.0018 4; α(M)=0.00038 8 α(N)=8.8×10⁻⁵ 17; α(O)=1.4×10⁻⁵ 3; α(P)=1.26×10⁻⁶ 41
		662.149 8	100 6	391.484	7/2+	M1		0.01155	α(K)=0.00984 14; α(L)=0.001340 19; α(M)=0.000288 4 α(N)=6.60×10⁻⁵ 10; α(O)=1.051×10⁻⁵ 15; α(P)=1.063×10⁻⁶ 15
		746.18 3	48 4	307.383	5/2+	M1		0.00861	α(K)=0.00734 11; α(L)=0.000995 14; α(M)=0.000214 3 α(N)=4.90×10⁻⁵ 7; α(O)=7.81×10⁻⁶ 11; α(P)=7.91×10⁻⁷ 11
1054.838	7/2+	747.40 3	40 4	307.383	5/2+				
		885.89 4	26 3	169.009	7/2−				
		976.20 4	37 7	78.638	7/2+	E0+(M1)+E2		0.0036[@] 9	α(K)=0.0031 8; α(L)=0.00042 10; α(M)=9.1×10⁻⁵ 20 α(N)=2.1×10⁻⁵ 5; α(O)=3.3×10⁻⁶ 8; α(P)=3.26×10⁻⁷ 87
		1054.86 4	100 7	0.0	5/2+	M1		0.00374	α(K)=0.00319 5; α(L)=0.000428 6; α(M)=9.19×10⁻⁵ 13 α(N)=2.10×10⁻⁵ 3; α(O)=3.36×10⁻⁶ 5; α(P)=3.42×10⁻⁷ 5
1064.663	(3/2)+	673.07 7	9 2	391.484	7/2+				
		757.300 20	50 4	307.383	5/2+				E_γ: given as 757.3000 20 by 1986Pr03.
		818.84[a] 3	23[a] 3	245.777	3/2+				
		1064.71 5	100 13	0.0	5/2+	M1		0.00366	α(K)=0.00312 5; α(L)=0.000419 6; α(M)=8.98×10⁻⁵

$^{155}_{63}Eu_{92}$-11

$\gamma(^{155}Eu)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[&]	Comments
									13
									α(N)=2.06×10^{-5} *3*; α(O)=3.28×10^{-6} *5*; α(P)=3.35×10^{-7} *5*
1068.891	5/2$^+$	187.241[b] *6*	<3	881.689	7/2$^-$				
		677.406[a] *6*	100[a] *8*	391.484	7/2$^+$				
		761.504[a] *10*	42[a] *4*	307.383	5/2$^+$				
1078.064?	(11/2$^-$)	577.107 *18*	100 *10*	501.006	9/2$^+$				
		590.905 *21*	81 *16*	487.088	13/2$^-$				
1096.18	(3/2$^+$,5/2$^+$)	220.1 *6*	100 *25*	876.831	(1/2)$^+$				
		1017.54 *11*	23.9 *7*	78.638	7/2$^+$				I_γ: 53.2% *16* relative to 1096γ.
		1096.17 *6*	45 *4*	0.0	5/2$^+$				
1101.670	3/2$^-$	178.572 *7*	17 *4*	923.148	1/2$^+$	E1		0.0593	α(K)=0.0502 *7*; α(L)=0.00709 *10*; α(M)=0.001525 *22* α(N)=0.000345 *5*; α(O)=5.30×10^{-5} *8*; α(P)=4.53×10^{-6} *7*
		224.8323 *25*	27 *3*	876.831	(1/2)$^+$	E1		0.0322	α(K)=0.0273 *4*; α(L)=0.00381 *6*; α(M)=0.000818 *12* α(N)=0.000185 *3*; α(O)=2.87×10^{-5} *4*; α(P)=2.53×10^{-6} *4*
		932.624 *16*	68 *5*	169.009	7/2$^-$	(E2)		0.00303	α(K)=0.00256 *4*; α(L)=0.000371 *6*; α(M)=8.03×10^{-5} *12* α(N)=1.83×10^{-5} *3*; α(O)=2.87×10^{-6} *4*; α(P)=2.63×10^{-7} *4*
		997.355 *25*	100 *5*	104.334	5/2$^-$	(E2)		0.00263	α(K)=0.00223 *4*; α(L)=0.000318 *5*; α(M)=6.87×10^{-5} *10* α(N)=1.568×10^{-5} *22*; α(O)=2.46×10^{-6} *4*; α(P)=2.29×10^{-7} *4*
1106.799	3/2$^-$,5/2$^-$	183.4 *5*	22 *5*	923.148	1/2$^+$				
		195.624 *6*	100.0 *16*	911.213	3/2$^+$	E1		0.0465	α(K)=0.0394 *6*; α(L)=0.00553 *8*; α(M)=0.001189 *17* α(N)=0.000270 *4*; α(O)=4.15×10^{-5} *6*; α(P)=3.59×10^{-6} *5*
		229.943 *5*	23 *4*	876.831	(1/2)$^+$				
		1002.38 *5*	47 *5*	104.334	5/2$^-$	M1+E2	−0.35 *6*	0.00404 *8*	α(K)=0.00345 *7*; α(L)=0.000465 *9*; α(M)=0.0001000 *19* α(N)=2.29×10^{-5} *5*; α(O)=3.64×10^{-6} *7*; α(P)=3.69×10^{-7} *8* I_γ: from 1986Pr03, (2n,γ). On this intensity scale (namely Iγ(195.6γ)=100), the value of Iγ(1002γ) as measured in the ^{155}Sm β^- decay would be 196 *47*. Mult.: as reported by 1986Pr03. Placement in level scheme requires E2 if J^π 1/2$^-$ for the 1106.7 level, as proposed by these authors.
1126.26?	(5/2$^+$)	818.84[a] *3*	24[a] *3*	307.383	5/2$^+$				
		880.34[b] *5*	28 *5*	245.777	3/2$^+$				
		1021.81[b] *11*	73 *9*	104.334	5/2$^-$				
		1126.38[a] *6*	100[a] *14*	0.0	5/2$^+$				
1132.029	(7/2)$^+$	631.023[a] *4*	100[a] *9*	501.006	9/2$^+$				
		740.532 *14*	17.4 *17*	391.484	7/2$^+$	M1		0.00877	α(K)=0.00748 *11*; α(L)=0.001014 *15*; α(M)=0.000218 *3* α(N)=4.99×10^{-5} *7*; α(O)=7.95×10^{-6} *12*; α(P)=8.06×10^{-7} *12*

$^{155}_{63}Eu_{92}$-12

$\gamma(^{155}Eu)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α&	Comments
1138.389	$7/2^+$	883.725 *13*	56 *4*	254.665	$9/2^-$	(E1)	1.37×10^{-3}	α(K)=0.001176 *17*; α(L)=0.0001530 *22*; α(M)=3.27×10^{-5} *5* α(N)=7.47×10^{-6} *11*; α(O)=1.182×10^{-6} *17*; α(P)=1.173×10^{-7} *17*
		959.05 *8*	28 *6*	179.157	$9/2^+$	M1	0.00469	α(K)=0.00401 *6*; α(L)=0.000538 *8*; α(M)=0.0001156 *17* α(N)=2.65×10^{-5} *4*; α(O)=4.22×10^{-6} *6*; α(P)=4.30×10^{-7} *6*
		969.33 *3*	100 *6*	169.009	$7/2^-$	E1	1.15×10^{-3}	α(K)=0.000986 *14*; α(L)=0.0001278 *18*; α(M)=2.73×10^{-5} *4* α(N)=6.24×10^{-6} *9*; α(O)=9.88×10^{-7} *14*; α(P)=9.86×10^{-8} *14*
		1034.15 *4*	41 *3*	104.334	$5/2^-$			
		1138.31 *12*	31 *3*	0.0	$5/2^+$			
1140.3	$(17/2^+)$	195.9 *5*	65 *4*	944.37	$(15/2^+)$			
		358.4 *5*	100 *6*	781.993	$13/2^+$			
		516.0 *5*	73 *6*	624.22	$15/2^-$			
1151.41	$9/2^+$	850.78 *10*	39 *7*	300.688	$11/2^+$			
		972.32 *6*	100 *13*	179.157	$9/2^+$	M1+(E0)	0.0093@ *31*	
		1072.67 *6*	77 *13*	78.638	$7/2^+$			
1190.55	$(21/2^-)$	208.2 *5*	23 *2*	982.58	$19/2^+$			
		223.2 *2*	82 *4*	967.16	$19/2^-$			
		389.5 *2*	100 *7*	801.17	$(17/2^-)$			
1193.79	$7/2^+$	939.14 *5*	63 *5*	254.665	$9/2^-$			
		1024.76 *5*	100 *12*	169.009	$7/2^-$			
		1089.47 *5*	94 *9*	104.334	$5/2^-$			
1198.09	$21/2^+$	230.8 *5*	13.7 *8*	967.16	$19/2^-$			
		412.9 *2*	100 *5*	785.22	$17/2^+$	E2	0.0226	α(K)=0.0182 *3*; α(L)=0.00347 *5*; α(M)=0.000770 *11* α(N)=0.0001741 *25*; α(O)=2.61×10^{-5} *4*; α(P)=1.771×10^{-6} *25*
1230.776	$5/2^+$	984.97 *7*	7 *2*	245.777	$3/2^+$			
		1126.38[a] *6*	100[a] *14*	104.334	$5/2^-$			
		1230.79 *3*	11 *5*	0.0	$5/2^+$			I_γ: after subtraction of contribution from a ^{156}Gd line.
1264.045?	$3/2^-,5/2^-$	256.737 *7*	24 *3*	1007.309	$3/2^+$	E1	0.0228	α(K)=0.0194 *3*; α(L)=0.00268 *4*; α(M)=0.000575 *8* α(N)=0.0001306 *19*; α(O)=2.03×10^{-5} *3*; α(P)=1.81×10^{-6} *3*
		1018	7 *1*	245.777	$3/2^+$			
		1159.52 *10*	100 *6*	104.334	$5/2^-$	M1	0.00299	α(K)=0.00256 *4*; α(L)=0.000341 *5*; α(M)=7.33×10^{-5} *11* α(N)=1.678×10^{-5} *24*; α(O)=2.68×10^{-6} *4*; α(P)=2.73×10^{-7} *4*; α(IPF)=2.41×10^{-6} *4*
		1262.4 *5*	17 *5*	0.0	$5/2^+$			
1301.59	$5/2,7/2^+$	1055	1.4 *4*	245.777	$3/2^+$			
		1132	2.2 *4*	169.009	$7/2^-$			
		1197.7 *4*	6.5 *9*	104.334	$5/2^-$			
		1223.02 *9*	49 *6*	78.638	$7/2^+$			
		1301.56 *5*	100 *10*	0.0	$5/2^+$			
1315.94	$(7/2^+)$	1061.44 *7*	98 *10*	254.665	$9/2^-$			

From ENSDF

$^{155}_{63}Eu_{92}$-13

$\gamma(^{155}Eu)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	α[&]	Comments
1315.94	(7/2+)	1146.56 *12*	100 *9*	169.009	7/2−			
		1211.49 *14*	90 *12*	104.334	5/2−			
1333.3	(19/2+)	388.6 *5*	100 *9*	944.37	(15/2+)			
		532.7 *5*	89 *9*	801.17	(17/2−)			
1380.14	23/2−	182.1 *5*	<16	1198.09	21/2+			
		189.4 *5*	37 *5*	1190.55	(21/2−)			
		413.0 *2*	100 *6*	967.16	19/2−	E2	0.0226	α(K)=0.0181 *3*; α(L)=0.00347 *5*; α(M)=0.000769 *11* α(N)=0.0001739 *25*; α(O)=2.61×10^{-5} *4*; α(P)=1.770×10^{-6} *25*
1427.2	23/2+	444.6 *2*	100	982.58	19/2+	E2	0.0184	α(K)=0.01487 *21*; α(L)=0.00274 *4*; α(M)=0.000607 *9* α(N)=0.0001373 *20*; α(O)=2.07×10^{-5} *3*; α(P)=1.464×10^{-6} *21*
1483.04	3/2+	1483.02 *8*	100	0.0	5/2+			
1548.58	(5/2+)	1469.94 *18*	100	78.638	7/2+			
1567.7	(21/2+)	427.4 *5*	100	1140.3	(17/2+)			
1632.56	7/2+	1453.40 *17*	100	179.157	9/2+			
1648.4?	(25/2−)	457.9[b] *5*	100	1190.55	(21/2−)			
1672.5	25/2+	474.4 *2*	100	1198.09	21/2+	E2	0.01540	α(K)=0.01253 *18*; α(L)=0.00224 *4*; α(M)=0.000495 *7* α(N)=0.0001122 *16*; α(O)=1.700×10^{-5} *24*; α(P)=1.242×10^{-6} *18*
1785.9?	(23/2+)	452.5[b] *5*	100	1333.3	(19/2+)			
1929.2	(27/2+)	502.0 *5*	100	1427.2	23/2+			
2198.7	(29/2+)	526.2 *5*	100	1672.5	25/2+			

[†] Values associated with γ′s whose energies are given to three significant figures or more are from ^{153}Eu(2n,γ). Those given only to the nearest 0.1 keV are generally from (^{7}Li,α2nγ). The others are generally from β^- decay.

[‡] Values associated with γ′s whose energies are given to only the nearest 0.1 keV are from (^{7}Li,α2nγ). The others are from ^{153}Eu(2n,γ), unless noted otherwise.

[#] For comments regarding the multipolarity and mixing ratio for this transition, see the (^{7}Li,α2nγ) data set.

[@] Computed by the evaluator from the α(K)exp value reported by 1986Pr03, assuming α(exp)=α(K)exp+1.33α(L) and α(K)/α(L)=7.2, this latter ratio representing a reasonable average between those of E0 and M1 and E2 transitions in this energy region.

[&] Additional information 2.

[a] Multiply placed with undivided intensity.

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

Adopted Levels, Gammas

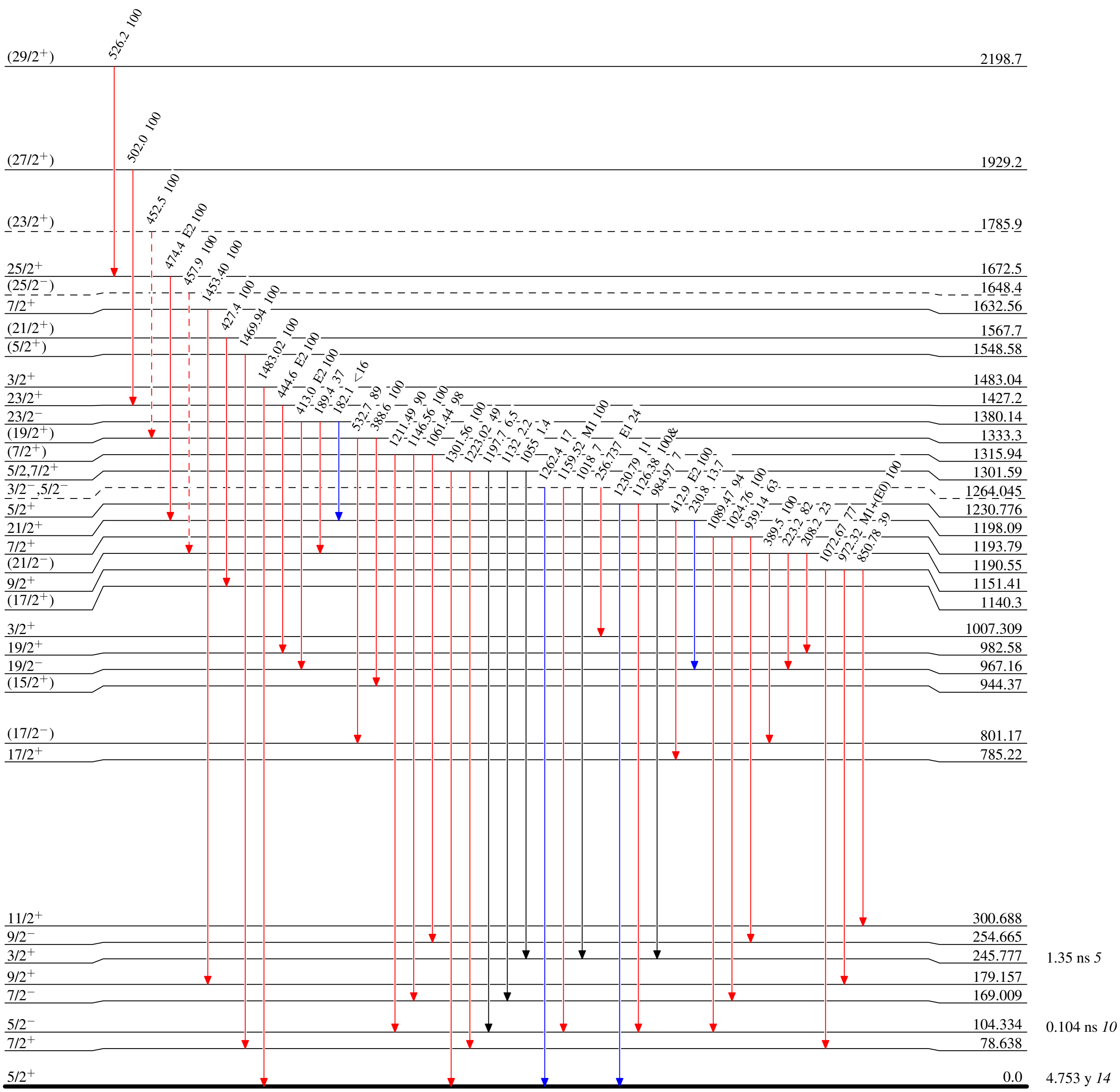
Level Scheme

Intensities: Type not specified

& Multiply placed: undivided intensity given

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)

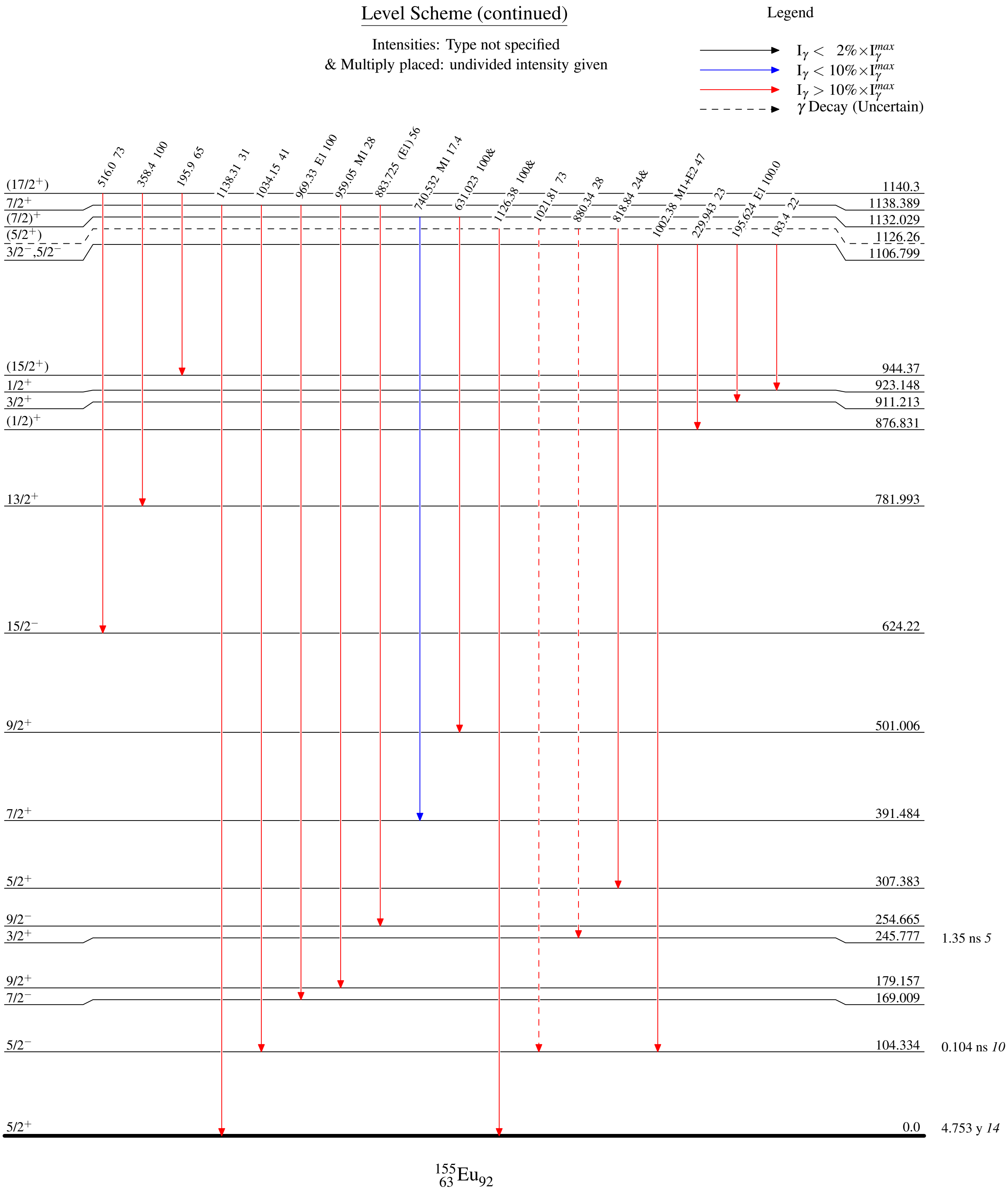


$^{155}_{63}$Eu$_{92}$

Adopted Levels, Gammas

Level Scheme (continued)

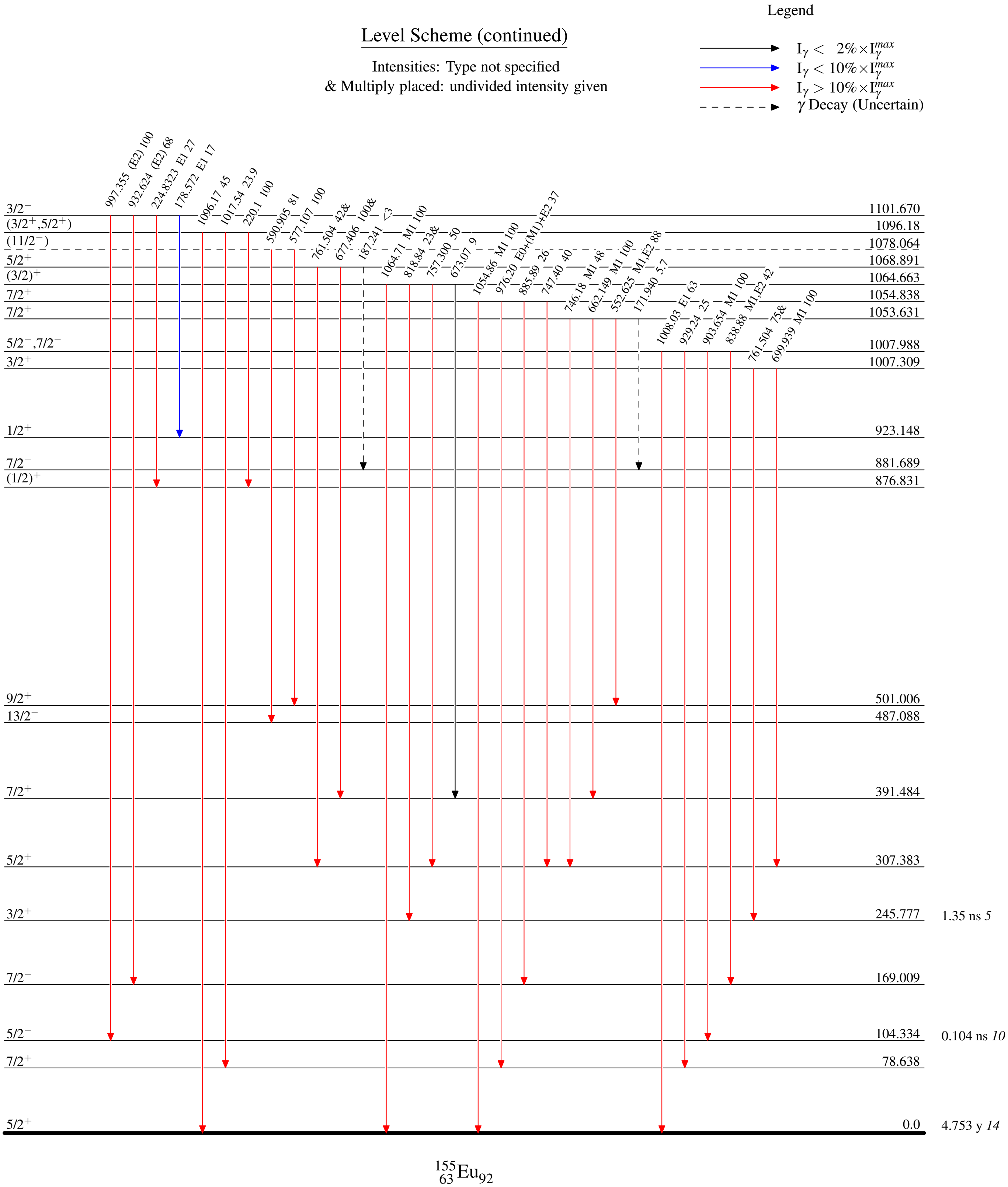
Intensities: Type not specified
& Multiply placed: undivided intensity given



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given

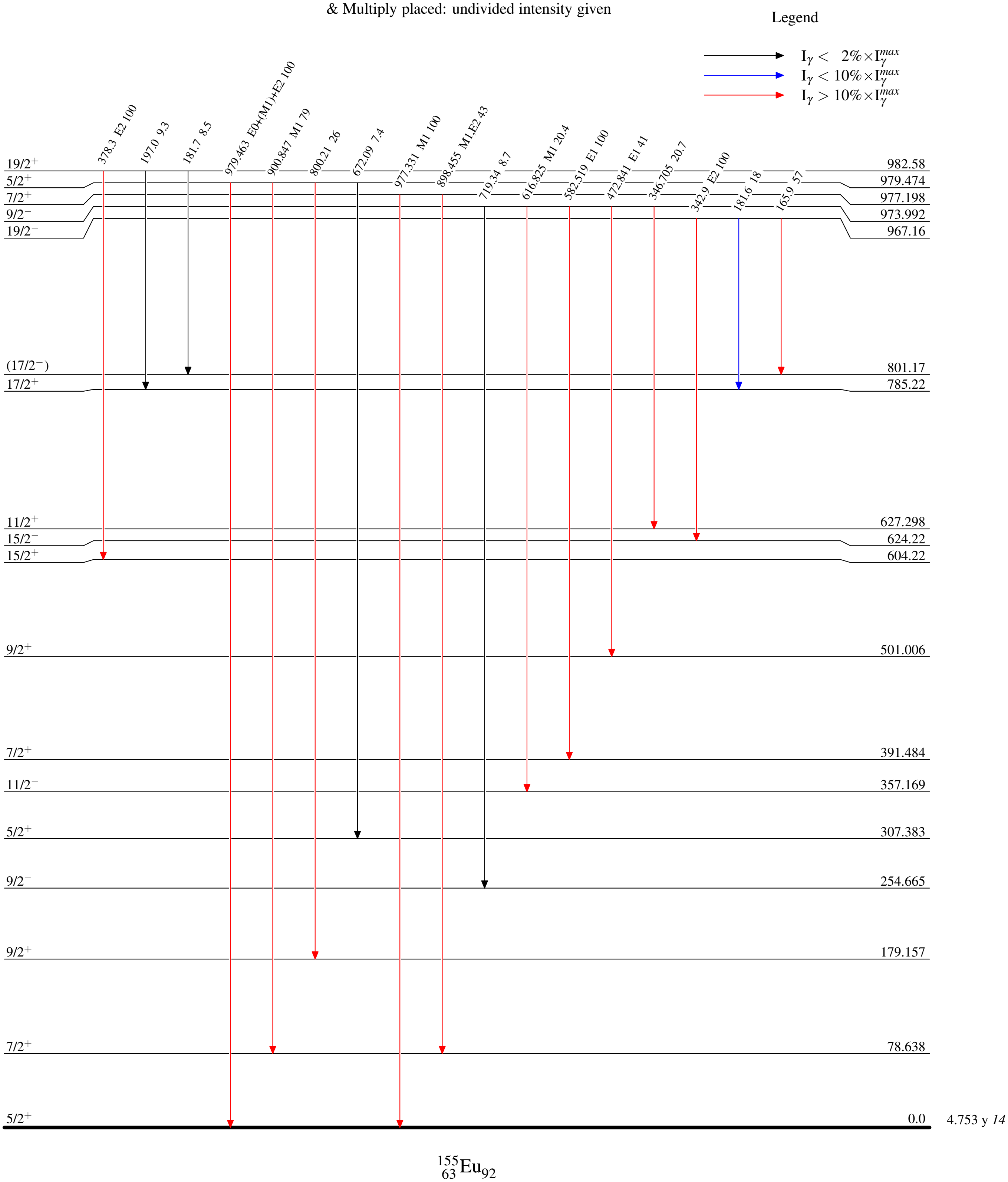


Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

& Multiply placed: undivided intensity given

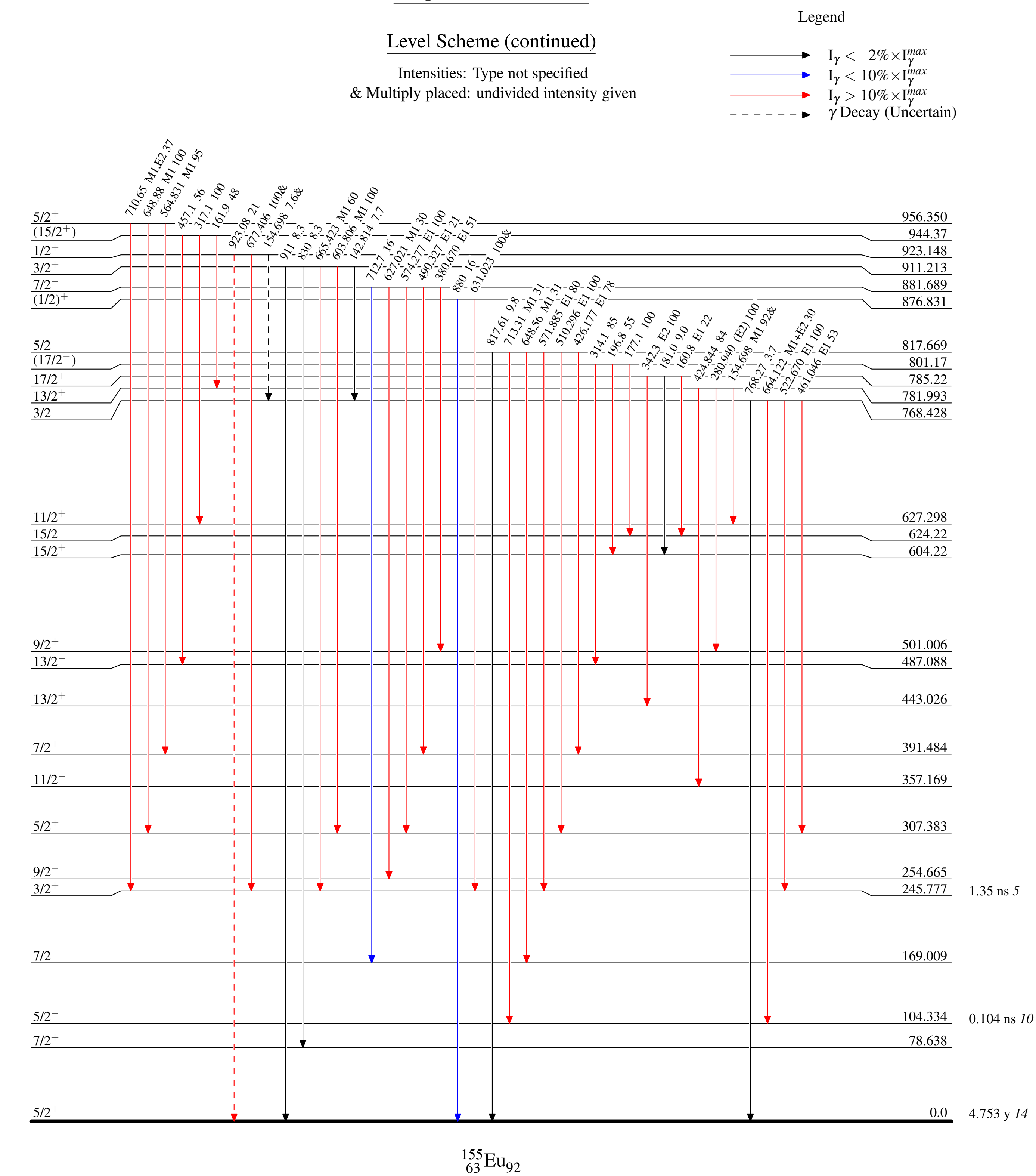


Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

& Multiply placed: undivided intensity given



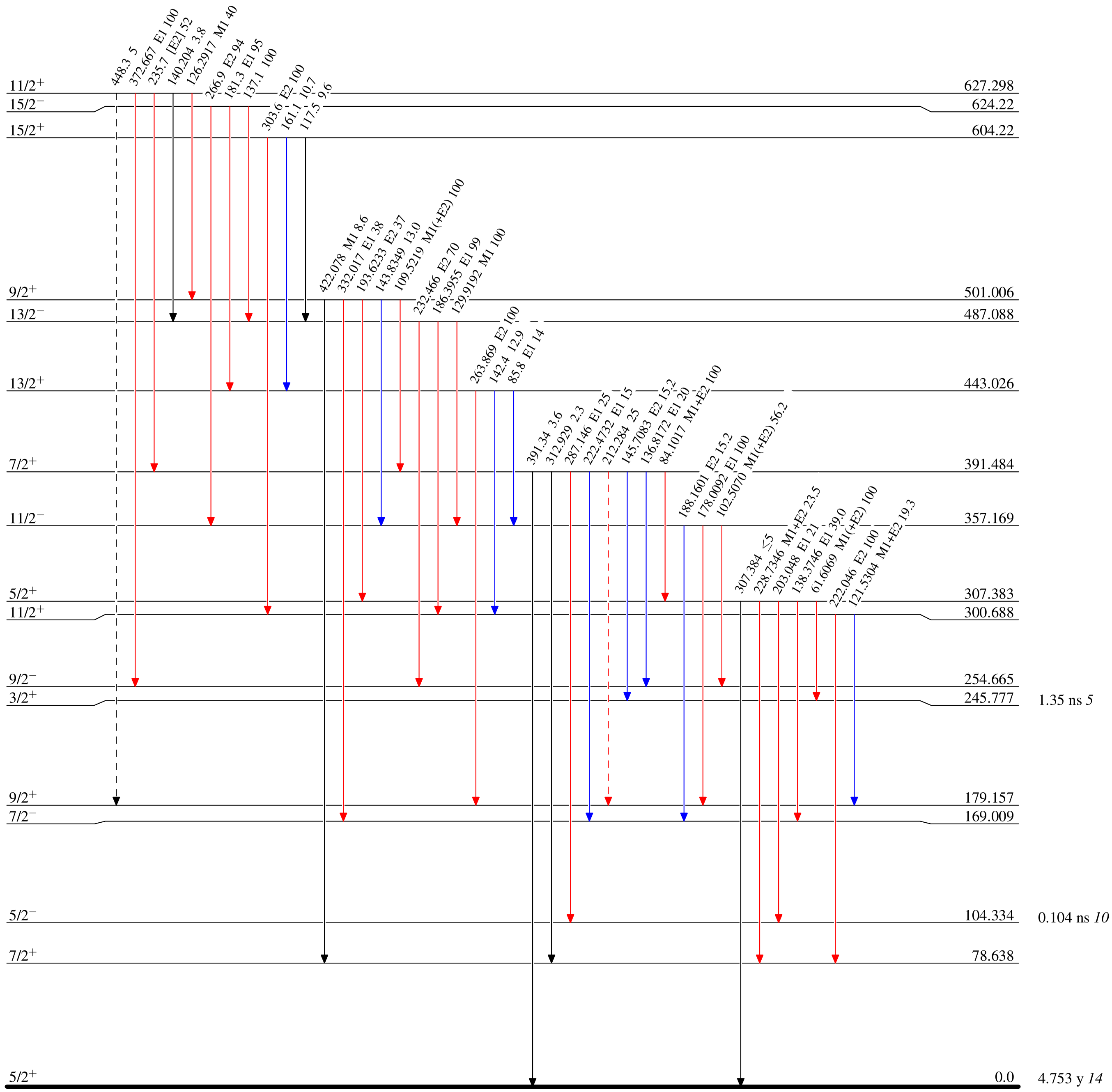
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)

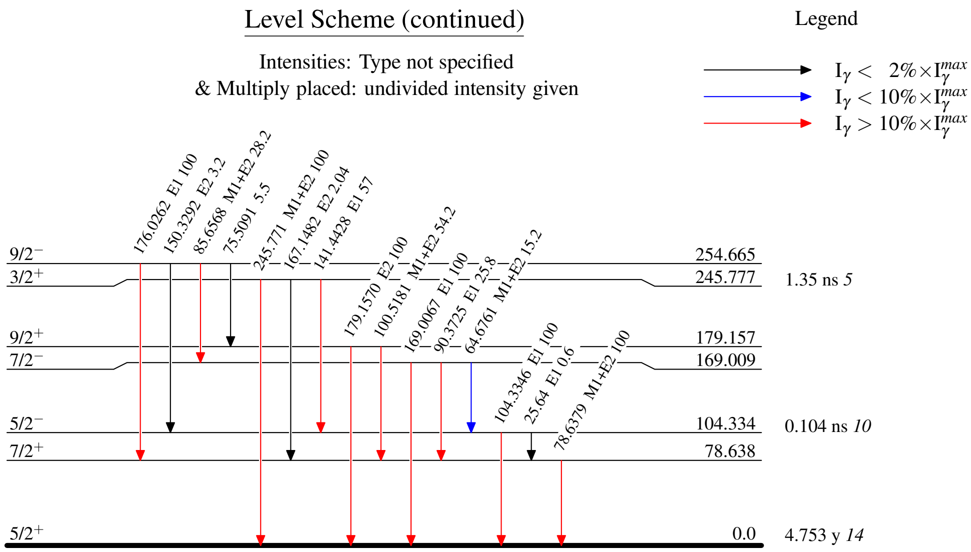


$^{155}_{63}Eu_{92}$

Adopted Levels, Gammas

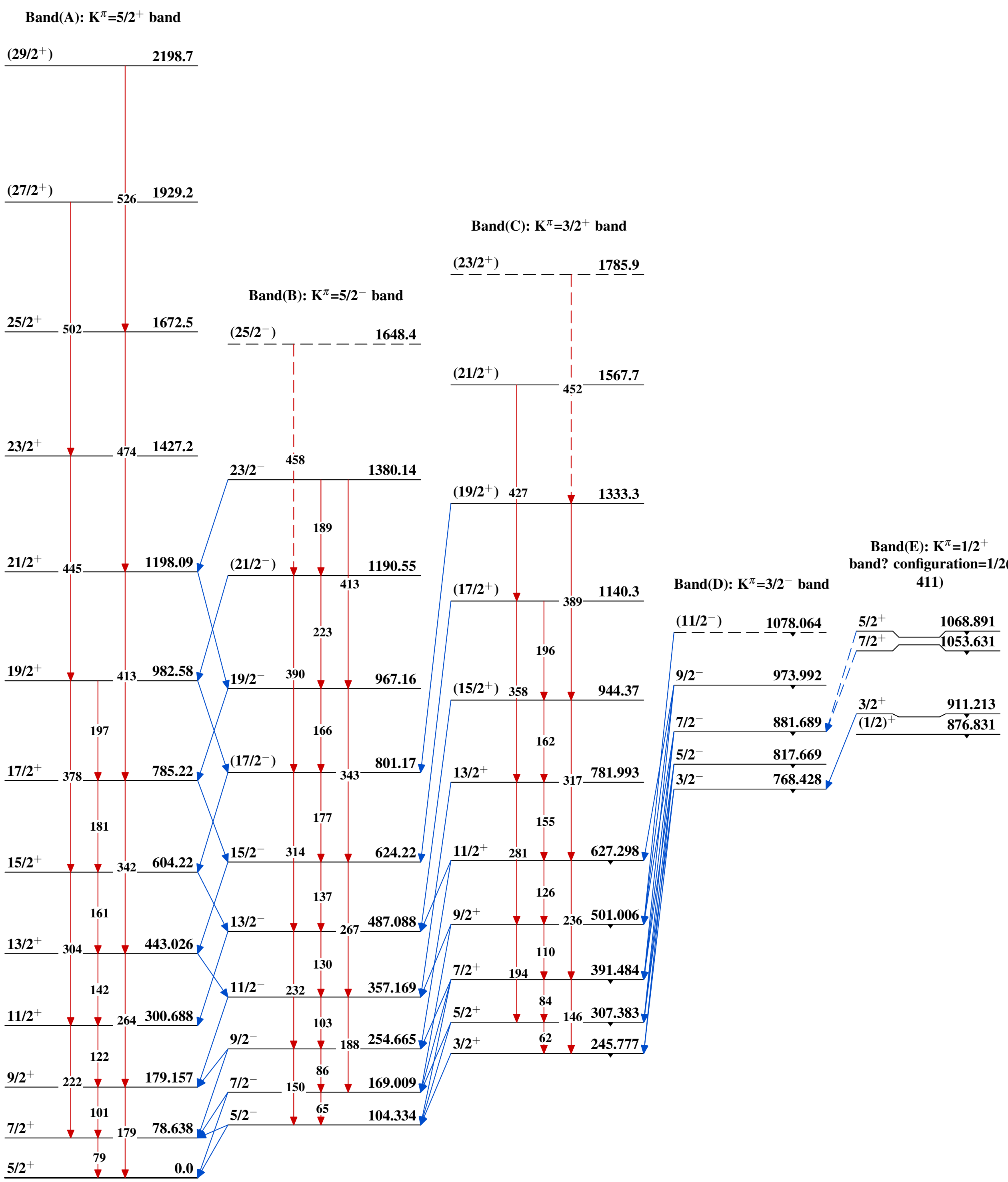
Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given



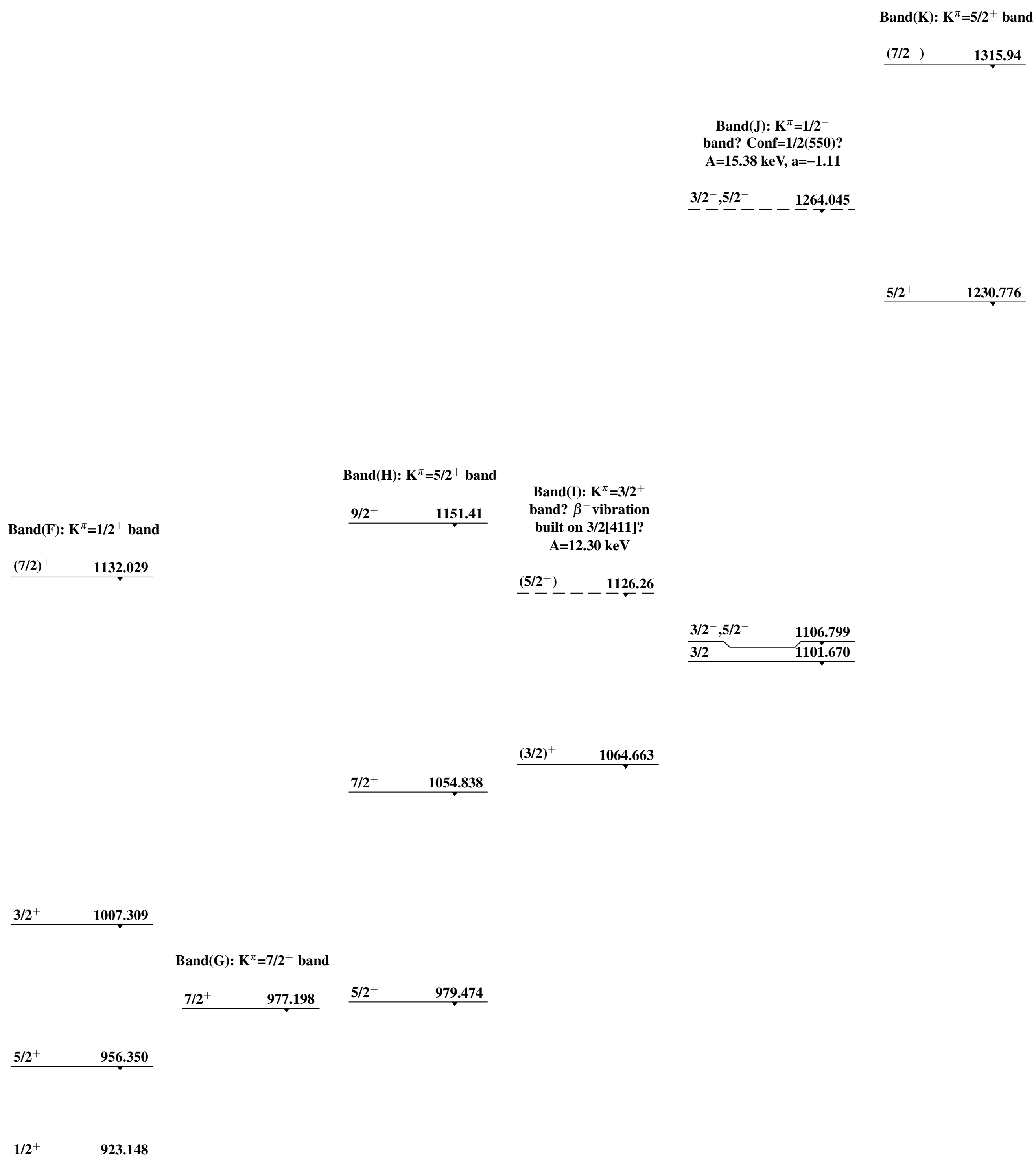
$^{155}_{63}Eu_{92}$

Adopted Levels, Gammas



$^{155}_{63}Eu_{92}$

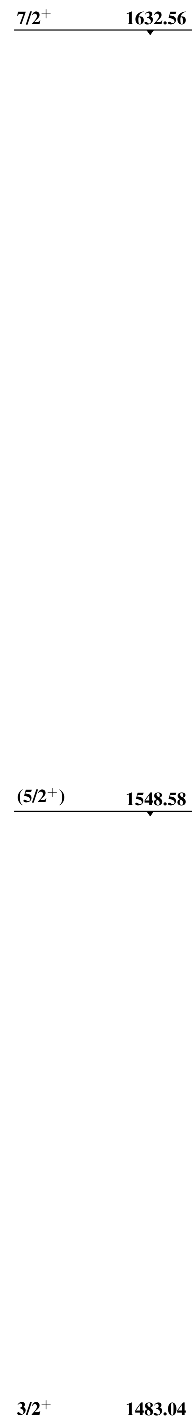
Adopted Levels, Gammas (continued)



$^{155}_{63}Eu_{92}$

Adopted Levels, Gammas (continued)

Band(L): K^{π}=3/2^{+} band



$^{155}_{63}Eu_{92}$