Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 170, 1 (2020)	16-Aug-2020

Q(β^-)=−484.7 *7*; S(n)=8550.28 *12*; S(p)=5893.6 *7*; Q(α)=272.1 *20* 2017Wa10

Model calculations that may be of interest include: γ half-lives (1966Fa06,1966Fa07); reflection asymmetry (1993Af01, 1995Af01, 1995Af05); configurations (1971SoZW, 1972So12, 1985GuZS, 1988Al32, 1993Ne10, 1993No01, 1995Dz02); and combined electron-nuclear radiation for ^{153}Gd ε decay (1995Sa56).

Some recent measurements of hyperfine structure: 2004Mb03, 2004Ma04, 2002Ga49, 2001Ga72, 2000Tr07.

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Calculated configurations for bandheads are:
     In those cases where the computed level energy is considerably
     different from the experimental energy, the calculated energy
     is given in parentheses after the keynumber.
Energy  Jπ   Configuration
   0    5/2+  5/2[413] 94-98%  1972So12, 1985GuZS, 1988Al32, 1993No01
  97    5/2-  5/2[532] 90-94%  1972So12 (20 keV), 1985GuZS, 1988Al32,
                               1993No01
 103    3/2+  3/2[411] 86-98%  1972So12 (-20 keV), 1985GuZS, 1988Al32,
              1993No01 with 1/2[411]+vibr. 5-6% 1972So12, 1988Al32
 569    7/2+  7/2[404] 88-93%  1985GuZS (342 keV), 1993No01 and 63%
              1988Al32 (1609 keV) with 21%, 7/2[523]+vibr.
 617    5/2+  5/2[413]+Q20     55-91% with 5/2[402] 5-40% 1985GuZS,
                               1988Al32
 634    1/2+  1/2[420] 64-76%  1985GuZS, 1988Al32, 1993No01 with
                               various vibr. contribution
 636    3/2-  3/2[541] 77-85%  1985GuZS (797 keV), 1988Al32(448
              keV), 1993No01 with various vibr. contributions
 707    5/2+  5/2[402] 16-42%  1985GuZS (1109 keV), 1988Al32 (1118
              keV) with 5/2[413]+vibr. 7-36% and various other
              vibr. components. According to 2005Bu02, the strength
              of 5/2[402] is spread over many levels and no single
              level can be assigned a dominant 5/2[402] configuration
        1/2+  1/2[411] 47-71%  1985GuZS, 1988Al32 (612 keV) with
                               various other components
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^{153}Eu Levels

Cross Reference (XREF) Flags

A	^{153}Sm β^- decay	F	^{152}Sm(α,t)	K	^{153}Eu(p,p′)
B	^{153}Gd ε decay	G	^{152}Eu(n,γ) E=thermal	L	Coulomb excitation
C	^{150}Nd(^{7}Li,4nγ)	H	^{152}Eu(d,p)	M	^{154}Sm(p,2nγ)
D	^{151}Eu(t,p)	I	^{153}Eu(γ,γ')	N	^{154}Sm(d,3nγ)
E	^{152}Sm(^{3}He,d)	J	^{153}Eu(n,n′γ)	O	^{154}Gd(t,α)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
0.0[@]	5/2+	stable	ABCD FGHIJKLMNO	μ=+1.5324 *3*; Q=+2.412 *21* $T_{1/2}$: ≥ 5.5E17 y is given by 2012Da16 (at 68% confidence level) from limit set by using the Gaussian fit to the 285.9 keV γ in ^{149}Sm, the daughter from β decay of ^{149}Pm g.s. following α decay of ^{153}Eu. <r^2>$^{1/2}$=5.1115 fm *62* (2013An02,evaluation). J^π: spin from electron paramagnetic resonance (1955Bl16), optical spectroscopy

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Adopted Levels, Gammas (continued)

^{153}Eu Levels (continued)

E(level)[†]	J$^{\pi}$	$T_{1/2}$	XREF	Comments
				(1935Sc01), laser spectroscopy (1985Ah02 and 1992HuZW); parity from M1+E2 γ from 5/2^{+} (172.8 level); also L(d,p)=5 from 3^{-} (^{152}Eu target). μ: From 2014StZZ compilation and from 1993HuZU based on collinear fast beam laser spectroscopy − accelerated beam. Others: +1.538 *13* (1985Ah02) and +1.555 *42* (see 1989Ra17 for original reference), 1.5330 *8* (1965Ev08), +1.54 (1984Do11), and +1.56 *4* (1986Al33). Q: From 2016St14 compilation and based on muonic atom x ray data of 1983Ta14; others: +2.28 *9* (1986Al33), 3.92 *12* (1981Br17), 3.6 *4* (1981Ar25), and 2.22 (1987Se12). 1993Mo04 give Q(^{151}Eu)/Q(^{153}Eu)=0.3919 *2* from laser spectroscopy and indicate this is not in good agreement with muonic atom data. Δ<r^{2}>(151,153)=0.577 fm^{2} *25* (1981Br17 and 1984Do11), 0.606 fm^{2} *18* (1984Ta05), +0.577 fm^{2} *25* (1986Al33). Other: 1987NeZW. See, also, 1995Fr22 for summary of data from methods based on electromagnetic interactions. <r^{2}>: From others data, 1993Ba55 deduce <r^{2}>= 25.99 fm^{2} *9*. See also 2004Mb03. Ratio of octupole moments for ^{151}Eu and ^{153}Eu given by 1991Ch43.
83.36728[@] *13*	7/2^{+}	0.793 ns *17*	ABC EFGHIJKLMNO	μ=+1.81 *6*; Q=0.44 *2* J$^{\pi}$: From Coulomb excited, M1 γ component to 5/2^{+} level, and band structure. $T_{1/2}$: Weighted average of 0.80 ns *2* (1966As03, Coul. ex.); 0.82 ns *7* [1966GrZZ, (γ,γ')]; 0.73 ns *7* (quoted in 1972Th09 from unpublished Coul. ex.); and 0.77 ns *5* (1986Sa34, ^{153}Gd ε decay). Other: 1.09 ns *5* (1961Bi11). μ: From 2014StZZ compilation based on Mossbauer measurements. Q: From 2016St14 compilation and based on muonic atom x ray data of 1984Ta04. The isomer shift, Δ<r^{2}>(0 keV, 83 keV)=−0.0017 fm^{2} *11* from Mossbauer measurements (1968At02) and 0.0036 fm^{2} *32* (1984Ta05).
97.43098[&] *14*	5/2^{-}	0.198 ns *16*	ABC eFG IJ LMNo	μ=+3.22 *23* or −0.52 *23*. J$^{\pi}$: From E1 γ's to 5/2^{+} and 7/2^{+} levels and log*ft*=6.7 from 3/2^{-}. $T_{1/2}$: Weighted average of 0.16 ns *2* [1964Ha43, (γ,γ')]; 0.214 ns *20* (1966At01, Mossbauer); 0.26 ns *3* [1966GrZZ, (γ,γ')]; 0.180 ns *20* (1968Ma15, ^{153}Gd ε decay); and 0.23 ns *4* (1972Th09) quoted in 1972Th09 from unpublished Coul. ex. These data are slightly inconsistent with the reduced-χ^{2}=2.62; the major difference is from the 0.16 *1* and 0.26 *3* values. μ: From 2014StZZ compilation and based on Mossbauer data of 1966At01. The isomer shift, Δ<r^{2}>(0 keV, 97 keV)=−0.14 fm^{2} *3* from Mossbauer measurements (1968Ko27).
103.18017[a] *12*	3/2^{+}	3.87 ns *5*	ABC eFG J LMNo	μ=+2.048 *6*; Q=1.253 *12* J$^{\pi}$: From M1 γ component to 5/2^{+} level, J ≠ 5/2 from $\gamma\gamma(\theta)$, J ≠ 7/2 from log*ft*=6.7 in β- decay from 3/2^{+} level; and μ=2.0 is consistent with Nilsson state assignment and Mossbauer measurement (1972Cr09). $T_{1/2}$: Weighted average of the following values (in ns): 3.95 *11* (2002Mo46), 3.87 *10* (1986Sa34), 3.9 *5* (1972Th09), 3.9 *2* (1966GrZZ), 3.90 *5* (1965Me08), 4.3 *5* (1961Ve04), 3.3 *2* (1961Re11), 3.8 *2* (1961Na06), 4.0 *2* (1956Ve19), 4.0 *2*

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Adopted Levels, Gammas (continued)

^{153}Eu Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$	XREF	Comments
				(1954Gr19), 3.0 *3* (1950Mc64). These data are slightly inconsistent with a reduced-χ^2=1.91 (critical-χ^2=1.83). Other value: 3.4 (1954Mc10). μ: From 2014StZZ compilation and based on data of 1972Cr09 and 1975Si07 based on Mossbauer effect and integral perturbed angular correlation method. Others: +2.01 *9* (1964At01) and 1.23 *33* (1971Be23). Q: From 2016St14 compilation. The isomer shift, Δ<r^2>(0 keV, 103 keV)=−0.16 fm^2 *3* (1968Ko27) and −0.085 fm^2 *13* (1969Ri02) from Mossbauer measurements.
151.6239[&] *3*	7/2$^-$	0.36 ns *7*	ABC EFG J LMNO	J$^{\pi}$: From E1 γ's to 5/2$^+$ and 7/2$^+$ levels, log$f_{1u}t$ ≈ 10 from 3/2$^+$ in β- decay, and band structure. T$_{1/2}$: From unpublished Coulomb excitation data quoted in 1972Th09.
172.85316[a] *13*	5/2$^+$	0.14 ns	ABCDEFG J LMNO	T$_{1/2}$: From $\beta\gamma$(t) (1954Gr19). Other: < 1 ns $\beta\gamma$(t) (1956Ve19). J$^{\pi}$: From L=0 in (t,p) from 5/2$^+$ target and M1 γ components to 3/2$^+$ and 7/2$^+$ levels.
193.0654[@] *6*	9/2$^+$	0.179 ns *9*	C FGH JKLMNO	J$^{\pi}$: From Coulomb excited, E2 γ to 5/2$^+$, and band structure. T$_{1/2}$: Weighted average of values from Coulomb excitation: 173 ps *6* (1998Sm06), 201 ps *14* (1972Th09) and 208 ps *21* (1966As03); the reduced-χ^2 is 2.7.
235.2805[&] *6*	(9/2$^-$)		C FG LMNO	XREF: F(?). J$^{\pi}$: From band structure and E1 γ to 7/2$^+$ level, and possibly γ to 9/2$^+$ level.
269.7361[a] *5*	(7/2$^+$)		A C FG J LMNO	J$^{\pi}$: From band structure, E2 γ to 3/2$^+$ level, and γ to 9/2$^+$.
321.8589[&] *6*	(11/2)$^-$		C EFGH LMNO	J$^{\pi}$: From L=5 in (^{3}He,d), E1 γ to 9/2$^+$ level, and band structure.
325.0661[@] *9*	11/2$^+$	52 ps *3*	C G JKLMN	J$^{\pi}$: From Coulomb excited, band structure, and M1 γ to 9/2$^+$. T$_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
396.4028[a] *8*	(9/2$^+$)		C EFG MNO	J$^{\pi}$: From band structure, E1 γ to 7/2$^-$ level, and γ to (11/2)$^-$.
403.289? *4*			G	
442.622? *3*	($^+$)		G	J$^{\pi}$: possible M1 γ to (7/2$^+$).
448.1384? *11*			G	
477.9272[&] *12*	(13/2$^-$)		C G LMNo	J$^{\pi}$: From band structure and γ's to (9/2$^-$) and 11/2$^+$ levels.
481.0512[@] *15*	13/2$^+$	19.8 ps *5*	C G KLMNo	J$^{\pi}$: From band structure, E2 γ to 9/2$^+$ level, and dipole γ to (11/2)$^-$. T$_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
537.9413[a] *12*	(11/2$^+$)		C G MNO	J$^{\pi}$: From band structure, E2 γ to 7/2$^+$ level, and γ to (11/2)$^-$.
552.4727? *14*			G	
559.7390 *16*			G	
569.31[b] *14*	(7/2$^+$)		EFG J LMNO	J$^{\pi}$: From band assignment and γ's to 5/2$^+$ and 7/2$^+$ levels. L=(4) in (^{3}He,d).
585.02 *15*			A	
589.34[&] *11*	(15/2$^-$)		C E G LMNO	J$^{\pi}$: From band structure and γ's to 11/2$^-$ and 13/2$^+$ levels.
617.18[c] *24*	(5/2$^+$)		FGH J LM	J$^{\pi}$: From band assignment and γ's to 5/2$^+$ and 7/2$^+$ levels.
634.62[d] *6*	(1/2$^+$)		A eG J M o	J$^{\pi}$: From band assignment and γ's to 3/2$^+$ and 5/2$^+$ levels.
636.516[e] *18*	3/2$^-$		A eG J o	J$^{\pi}$: From band assignment and γ's to 3/2$^+$, 5/2$^+$, and 5/2$^-$ levels.
641.587 *3*			G	
654.700[@] *9*	(15/2$^+$)	10.05 ps *21*	C G LMN	J$^{\pi}$: From band structure, E2 γ to 11/2$^+$ level, and γ to 13/2$^-$. T$_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
657.68? *14*			A	

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Adopted Levels, Gammas (continued)

^{153}Eu Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$	XREF	Comments
681.90[e] *6*	(5/2$^-$)		A G J M	J$^{\pi}$: From band assignment and γ's to 3/2$^+$, 5/2$^-$, and 7/2$^+$ levels.
694.185[d] *24*	5/2$^+$		A DEFG J MNO	J$^{\pi}$: From L=0 in (t,p) from 5/2$^+$ target.
701.39 *17*			A	
706.629[‡#] *24*	5/2$^+$		A DEFG J M O	J$^{\pi}$: From L=0 in (t,p) from 5/2$^+$ target.
711.1[b] *5*	(9/2$^+$)		J LM	J$^{\pi}$: From band assignment and γ's to 5/2$^+$ and 9/2$^+$ levels.
713.11 *19*	(3/2$^+$)		A G	J$^{\pi}$: primary γ from 1/2$^-$ capture state; γ to 7/2$^+$.
716.173[a] *7*	(13/2$^+$)		C G MN	J$^{\pi}$: From band structure and γ's to (9/2$^+$) and (11/2$^+$) levels.
718.69[d] *14*	(3/2$^+$)		A EFG J M O	XREF: F(716). J$^{\pi}$: From band assignment and γ's to 3/2$^+$ and 5/2$^+$ levels. L=(2) from (α,t)/(^{3}He,d) σ ratio.
732.52[c] *8*	(7/2$^+$)		Gh J M	E(level): Uncertainty is from primary γ from (n,γ) data. J$^{\pi}$: From band assignment and γ's to 5/2$^+$ and 9/2$^+$ levels.
736 *3*			F h O	XREF: F(722). E(level): 2005Bu02 suggest that this level is likely to Be different from the 732.5, (7/2$^+$) assigned to β-vibrational band based on 5/2[413], since a level of vibrational character is not expected to Be populated in single-particle transfer reactions. Note that the bandhead of 5/2[413]+Q$_{20}$ at 617 is not seen in the single- proton-transfer reactions.
760.39 *14*			A f J o	
763.8? *6*			A f o	
783.24 *10*	(3/2$^+$,5/2$^+$)		EFG O	E(level): From primary γ in (n,γ) data. J$^{\pi}$: L=(2) from (α,t)/(^{3}He,d) σ ratio.
788.94 *10*	1/2$^+$		J	J$^{\pi}$: From γ to (3/2$^+$) level; excitation probability in (n,n$'\gamma$).
797.146 *24*			G	
819[e] *2*	(11/2$^-$)		EF O	J$^{\pi}$: L=(5) from (α,t)/(^{3}He,d) σ ratio.
825.39[&] *14*	(17/2$^-$)	5.0 ps *4*	C LMN	J$^{\pi}$: From band structure, dipole γ to (15/2$^-$) level, and E2 to (13/2$^-$). T$_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
827.42[#] *7*	(7/2$^+$)		D J M	J$^{\pi}$: L=(2) in (t,p) from 5/2$^+$ target; γ's to 5/2$^-$ and 9/2$^+$ levels.
840.58 *10*	(3/2$^+$)		EFG J	J$^{\pi}$: From L=2 in (^{3}He,d).
851.7[@] *3*	(17/2$^+$)	5.96 ps *21*	C LMN	J$^{\pi}$: From band structure and γ's to 13/2$^+$ and 15/2$^-$ levels. T$_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
855 *3*			O	
876.67[c] *7*	(9/2$^+$)		J M	J$^{\pi}$: γ's to 5/2$^+$ and 11/2$^+$ levels.
880 *2*	($^+$)		D	J$^{\pi}$: L=(2) in (t,p) from 5/2$^+$ target. E(level): 2005Bu02 present detailed arguments that this level is different from the 876.67, (9/2$^+$) level assigned to β-vibrational band based on 5/2[413], primarily, based on the fact that the bandhead of 5/2[413]+Q$_{20}$ configuration at 617 is not populated in the (t,p) reaction.
887.6[d] *4*	(7/2$^+$)		EFG O	XREF: O(892). E(level): From primary γ in (n,γ) data. J$^{\pi}$: from relative population in (t,α) this level is suggested (by 2005Bu02) as the 7/2$^+$ member of the 1/2[420] band.
891.3[a] *4*	(15/2$^+$)		C MN	J$^{\pi}$: From band structure and γ's to (11/2$^+$) and (13/2$^+$) levels.
897.52 *12*			G	
924 *2*			O	
942.6			N	
948 *2*			D	

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Adopted Levels, Gammas (continued)

^{153}Eu Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
954.5[&] *4*	(19/2⁻)	4.6 ps *21*	C LMN	J^π: From band structure, Q γ to (15/2⁻) level, and γ to (17/2⁺). $T_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
965 *2*			O	
970.3 *4*			G	
986 *3*			O	
1012.2 *3*			G	
1023.10 *16*	(⁺)		D G O	XREF: D(1020)O(1026). J^π: L=(2) in (t,p) from 5/2⁺ target. E(level): From primary γ in (n,γ) data.
1050 *3*			E	
1061.6[@] *3*	(19/2⁺)	5.5 ps *6*	C LMN	J^π: From band structure, E2 γ to (15/2⁺) level, and γ (17/2⁺). $T_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
1073[f] *2*	(11/2⁻)		EF O	J^π: L=(5) from (α,t)/(^{3}He,d) σ ratio.
1114.1[a] *5*	(17/2⁺)		C M	J^π: From band structure and γ's to (15/2⁻), (13/2⁺), and (15/2⁺) levels.
1123 *3*			O	
1137 *2*			EF	
1149.87[‡] *21*	5/2⁺		DE G O	E(level): From primary γ in (n,γ) data. J^π: From L=0 in (t,p) from 5/2⁺ target.
1156.9 *10*			I	
1167 *2*	(1/2⁻)		E	J^π: L=(1,0) from (α,t)/(^{3}He,d) σ ratio.
1177.2 *7*	5/2		F I O	XREF: F(1180)O(1180).
1188[g] *2*	(1/2⁻)		E	J^π: L=(1,0) from (α,t)/(^{3}He,d) σ ratio.
1204 *3*			E	
1225.3[g] *3*	(5/2⁻)		DEFG O	XREF: E(1223). E(level): From primary γ in (n,γ) data. J^π: From L=(3) in (^{3}He,d), possible band assignment.
1231 *2*	(5/2⁻,7/2⁻)		EF	XREF: E(1236). J^π: L(^{3}He,d)=L(α,t)=(3).
1244 *2*			F O	
1262.7[&] *4*	(21/2⁻)	1.9 ps *4*	C LMN	J^π: From band structure, (E2) γ to (17/2⁻) level, and γ to (19/2⁺). $T_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
1271 *3*			O	
1293.9[@] *4*	(21/2⁺)	2.34 ps *8*	C L N	J^π: From band structure, E2 γ to (17/2⁺) level, and γ to (19/2⁻). $T_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
1308 *3*	1/2⁻,3/2⁻		EF O	J^π: From L=1 in (^{3}He,d).
1314.2[a] *7*	(19/2⁺)		C	J^π: From band structure and γ's to (15/2⁺) and (17/2⁻) levels.
1332[g] *2*	(9/2⁻)		EF O	J^π: L=(3,4) from (α,t)/(^{3}He,d) σ ratio; possible band assignment.
1350.89 *16*			D G	XREF: D(1352). E(level): From primary γ in (n,γ) data.
1357 *2*	5/2⁻,7/2⁻		EF O	J^π: L=3 in (^{3}He,d).
1396.03 *9*			D GH	XREF: H(1400).
1404.8[&] *5*	(23/2⁻)		C L N	J^π: From band structure, Q γ to (19/2⁻) level, and γ to (21/2⁺).
1417.66 *9*			E G O	XREF: E(1436)O(1435). E(level): From primary γ in (n,γ) data.
1438 *2*	5/2⁺		DE O	XREF: D(1442)E(1436)O(1435). J^π: From L=0 in (t,p) from 5/2⁺ target.
1477[‡] *2*	5/2⁺		DEF	J^π: From L=0 in (t,p) from 5/2⁺ target.
1534.9[@] *5*	(23/2⁺)	1.72 ps *10*	C L N	J^π: From band structure and γ's to (19/2⁺) and (21/2⁻) levels.

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Adopted Levels, Gammas (continued)

^{153}Eu Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
				$T_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
1546 *3*			O	
1558 *3*			E	
1575.0[a] *5*	$(21/2^+)$		C	J^π: From band structure and γ's to $(17/2^+)$ and $(19/2^-)$ levels.
1583 *3*			E	
1599 *3*			E	
1628 *2*			E O	
1661 *3*			E O	
1683 *2*	$(^+)$		D	J^π: L=(2) in (t,p) from $5/2^+$ target.
1720 *4*			O	
1740 *4*			H O	
1771.0[h] *4*	$(19/2^-)$	475 ns *10*	C	$T_{1/2}$: From ^{150}Nd(^{7}Li,4nγ). J^π: From band structure, E1 γ to $(17/2^+)$ level, and γ to $(21/2^+)$.
1772.1[&] *5*	$(25/2^-)$		C L N	J^π: From band structure and γ's to $(21/2^-)$ and $(23/2^-)$ levels.
1779 *4*			H O	
1796.3[a] *6*	$(23/2^+)$		C	J^π: From band structure and γ's to $(19/2^+)$ and $(21/2^+)$ levels.
1798.4[@] *6*	$(25/2^+)$	1.25 ps *10*	C L	J^π: From band structure, Q γ to $(21/2^+)$ level, and γ to $(23/2^-)$. $T_{1/2}$: From Coulomb excitation (1998Sm06, recoil-distance method).
1843			H	
1870 *4*			H	
1915 *4*			H	
1925.9[&] *6*	$(27/2^-)$		C L N	J^π: From band structure, Q γ to $(23/2^-)$ level, and γ to $(25/2^-)$.
1932 *3*			H	
1961 *3*			H	
1971.1[h] *5*	$(21/2^-)$		C	J^π: From band structure and γ to $(19/2^-)$ level.
1982 *3*			H	
2028 *3*			H	
2045 *3*			H	
2065.6[@] *6*	$(27/2^+)$		C L	J^π: From band structure, Q γ to $(23/2^+)$ level, and γ to $(25/2^+)$.
2082 *5*			H	
2082.8[a] *6*	$(25/2^+)$		C	J^π: From band structure and γ's to $(21/2^+)$ and $(23/2^+)$ levels.
2099 *4*			H	
2118 *3*			H	
2182.3[h] *5*	$(23/2^-)$		C	J^π: From band structure and γ to $(19/2^-)$ and $(21/2^-)$ levels.
2218 *3*			H	
2236 *5*			H	
2295.0 *10*			HI	
2324.0 *10*			HI	
2337.8[&] *6*	$(29/2^-)$		C L	J^π: From band structure and γ's to $(25/2^-)$ and $(27/2^-)$ levels.
2346.0 *10*			I	
2355.4[@] *6*	$(29/2^+)$		C L	J^π: From band structure, Q γ to $(25/2^+)$ level, and γ to $(27/2^+)$.
2369.0 *10*			HI	
2401.6[h] *5*	$(25/2^-)$		C	J^π: From band structure and γ to $(21/2^-)$ and $(23/2^-)$ levels.
2408			H	
2496 *5*			H	
2501.0[&] *7*	$(31/2^-)$		C L	J^π: From band structure, Q γ to $(27/2^-)$ level, and γ to $(29/2^-)$.
2527 *4*			H	
2561.0 *10*			I	
2610 *4*			H	
2626.9[h] *6*	$(27/2^-)$		C	J^π: From band structure and γ to $(23/2^-)$ and $(25/2^-)$ levels.
2630.0 *10*			I	
2646.2[@] *7*	$(31/2^+)$		C L	J^π: From band structure, Q γ to $(27/2^+)$ level, and γ to $(29/2^+)$.
2648.0 *10*			HI	

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Adopted Levels, Gammas (continued)

^{153}Eu Levels (continued)

E(level)[†]	J$^\pi$	$T_{1/2}$	XREF	Comments
2697.0 *10*			I	
2707 *5*			H	
2724.0[a] *9*	(29/2$^+$)		C	J$^\pi$: From band structure and γ's to (25/2$^+$) and (27/2$^-$) levels.
2730.0 *10*			I	
2761.2 *7*			I	
2808			H	
2837.0 *10*			I	
2859.0[h] *6*	(29/2$^-$)		C	J$^\pi$: From band structure and γ to (25/2$^-$) and (27/2$^-$) levels.
2878.0 *10*			I	
2891.0 *10*			I	
2930.1[&] *7*	(33/2$^-$)		C L	J$^\pi$: From band structure and γ's to (29/2$^-$) and (31/2$^-$) levels.
2957.3[@] *7*	(33/2$^+$)		C L	J$^\pi$: From band structure and γ's to (29/2$^+$) and (31/2$^+$) levels.
3101.5[&] *9*	(35/2$^-$)	8.6 ns *13*	C L	J$^\pi$: From band structure and γ's to (31/2$^-$) and (33/2$^-$) levels.
3267.5[@] *8*	(35/2$^+$)		C L	J$^\pi$: From band structure and γ's to (31/2$^+$) and (33/2$^-$) levels.
3445.9[&]	(37/2$^-$)		C L	J$^\pi$: From band structure and γ to (33/2$^-$) and (35/2$^-$) levels.
3594.1[@]	(37/2$^+$)		C L	J$^\pi$: From band structure and γ to (33/2$^+$) level.
3665.8[&]	(39/2$^-$)		C	J$^\pi$: From band structure and γ to (35/2$^-$) level.
3736.5 *12*	(39/2$^-$)		C	J$^\pi$: From Q γ to (35/2$^-$) level.
3918.4[@] *12*	(39/2$^+$)		C	J$^\pi$: From band structure and γ to (35/2$^+$) level.
3979.6[&]	(41/2$^-$)		C	J$^\pi$: From band structure and γ to (37/2$^-$) level.
4234.4[&]	(43/2$^-$)		C	J$^\pi$: From band structure and γ to (39/2$^-$) level.
4251.9[@]	(41/2$^+$)		C	J$^\pi$: From band structure and γ to (37/2$^+$) level.
4426.9 *16*	(43/2$^-$)		C	J$^\pi$: From band structure and γ to (39/2$^-$) level.
4584.2[@]	(43/2$^+$)		C	J$^\pi$: From band structure and γ to (39/2$^+$) level.
4599.2[&]	(45/2$^-$)		C	J$^\pi$: From band structure and γ to (41/2$^-$) level.
4928.6[@]	(45/2$^+$)		C	J$^\pi$: From band structure and γ to (41/2$^+$) level.

[†] From least-squares fit to γ energies where the latter have uncertainties and including γ's with questionable placements, or from the average of values from various reactions. The results of the primary γ's from (n,γ) have been used only where noted.

[‡] Mixed 5/2$^+$ state with complex configurations (2005Bu02) suggested by the population in both the (t,p) and in the single-particle transfer reactions.

[#] Earlier suggested (1998He06) configuration of 5/2[402] for this level is not given by 2005Bu02. According to the analysis of particle-transfer data and discussion by 2005Bu02, 5/2[402] strength is fragmented over many states and it is difficult to determine which level has the dominant 5/2[402] configuration.

[@] Band(A): 5/2[413] band. A=11.48, B=+0.0174.

[&] Band(B): 5/2[532] band. A=5.36, B=+0.097.

[a] Band(C): 3/2[411] band. A=14.03, B=−0.0079.

[b] Band(D): 7/2[404] band. A=15.79.

[c] Band(E): 5/2[413]+Q_{20}. A=16.5. Admixture of possible 5/2[402] configuration is determined (2005Bu02) as ≤1% from analysis of transfer data for 617, (5/2$^+$) level.

[d] Band(F): 1/2[420] band (strongly mixed). A=11.55, a=+1.425. The 694, 5/2$^+$ and 719, 3/2$^+$ levels are strongly mixed according to the analysis by 2005Bu02, one small component being 5/2[402].

[e] Band(G): 3/2[541] band (strongly mixed). A=9.084. Significant contribution from 1/2[550] configuration. Other orbitals that can mix are: 5/2[532] and 7/2[523].

[f] Band(H): 7/2[523] band (strongly mixed). The assignment is from 2005Bu02.

[g] Band(I): 1/2[541] band (?). Possible band assignment from 2005Bu02 based on systematics of neighboring nuclides and

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{153}Eu Levels (continued)

approximate L values from (α,t)/(^{3}He,d) σ ratio.

[h] Band(J): Band based on (19/2$^-$) isomer.

γ(^{153}Eu)

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	δ&	α@	$I_{(\gamma+ce)}$	Comments
83.36728	7/2+	83.36717 *21*	100	0.0	5/2+	M1+E2	0.81 *4*	3.76 *7*		α(K)=2.33 *4*; α(L)=1.11 *5*; α(M)=0.257 *12* α(N)=0.0573 *25*; α(O)=0.0080 *4*; α(P)=0.000230 *5* B(M1)(W.u.)=0.00608 *28*; B(E2)(W.u.)=303 *20* δ: From 0.82 *4* (1961Ru01) and 0.75 *13* (1962Su01) from α_K(exp) and L subshell ratios. Others: 0.82 *10* (1960Be16) from α_K(exp) and 1.12 *3* (1961Mo07) from α_K(exp) and L subshell ratios.
97.43098	5/2−	14.06383 *20*	0.12 *2*	83.36728	7/2+	E1		10.89		B(E1)(W.u.)=3.9×10^{-4} *+11−9* α(L)=8.54 *12*; α(M)=1.90 *3* α(N)=0.405 *6*; α(O)=0.0479 *7*; α(P)=0.00189 *3* E_γ: From level energies. I_γ: Calculated from I_{ce} and theoretical values of α_L and α_M.
		97.43100 *21*	100	0.0	5/2+	E1		0.305		B(E1)(W.u.)=9.8×10^{-4} *+9−7* α(K)=0.256 *4*; α(L)=0.0382 *6*; α(M)=0.00823 *12* α(N)=0.00185 *3*; α(O)=0.000278 *4*; α(P)=2.13×10^{-5} *3* Mult.: From α_K(exp) (1960Su08, 1962Su01, 1967Bo11, 1969Sm04, 1974Se08).
103.18017	3/2+	19.81296 *19*		83.36728	7/2+	E2		3.22×10^3	1.0 *3*	ce(L)/(γ+ce)=0.775 *8*; ce(M)/(γ+ce)=0.180 *4* ce(N)/(γ+ce)=0.0395 *8*; ce(O)/(γ+ce)=0.00520 *11*; ce(P)/(γ+ce)=2.11×10^{-6} *5* α(L)=2.49×10^3 *4*; α(M)=578 *8* α(N)=127.1 *18*; α(O)=16.73 *24*; α(P)=0.00678 *10* B(E2)(W.u.)=1.1 *4* E_γ: From level energies. Mult.: From L subshell ratios (1960Mo12,1961Mo07). $I_{(\gamma+ce)}$: Average of values relative to Iγ(103) from intensity balances at the 83 level in ^{153}Sm b- and ^{153}Gd ε decays, assuming no β- or ε feeding of the 83 level.
		103.18012 *17*	100 *2*	0.0	5/2+	M1+E2	0.119 *3*	1.694		α(K)=1.422 *20*; α(L)=0.213 *3*; α(M)=0.0462 *7* α(N)=0.01057 *15*; α(O)=0.001662 *24*; α(P)=0.0001568 *22* B(M1)(W.u.)=0.001890 *45*; B(E2)(W.u.)=1.33 *10* δ: Value is associated with a penetration parameter of λ=5.3 *8*; another analysis of α_K(exp) and L subshell ratio data gives

Adopted Levels, Gammas (continued)

γ(^{153}Eu) (continued)

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#	δ&	α@	Comments
									δ=0.118 +*2*−*4* with λ=5.7 +*12*−*10* (1971Pr15) and δ=0.120 *2* with λ=5.0 +*6*−*7* (1972Kr20). Others: 0.27 *13* (1971Kr19) from $\gamma\gamma(\theta)$; 0.123 *4* (1961Ru01) and 0.129 *5* (1965Ba37 reanalysis of earlier data) from L subshell ratios; 0.148 *10* (1961Mo07), 0.105 *15* (1962Su01), 0.101 *1* (1969Sm04) from α_K(exp) and L subshell ratios; and 1970Me26 and 1974Se08.
151.6239	7/2⁻	54.1934 *4*	25 *3*	97.43098	5/2⁻	M1(+E2)		18.4 *76*	α(K)=6.3 *28*; α(L)=9.3 *80*; α(M)=2.2 *19* α(N)=0.48 *42*; α(O)=0.065 *55*; α(P)=6.8×10^{-4} *35* B(M1)(W.u.)=0.008 +*21*−*8* I_γ: From ^{152}Eu(n,γ) and (d,3nγ). Others: 12 *3* from ^{153}Sm β- decay. Mult.: From α_K(exp) (1974Se08).
		68.2557 *5*	21 *2*	83.36728	7/2⁺	E1		0.790	α(K)=0.657 *10*; α(L)=0.1042 *15*; α(M)=0.0225 *4* α(N)=0.00503 *7*; α(O)=0.000739 *11*; α(P)=5.20×10^{-5} *8* B(E1)(W.u.)=7×10^{-5} +*8*−*3* I_γ: From ^{152}Eu (n,γ). Other: 12 *4* from ^{153}Sm β- decay. Mult.: From α_K(exp) (1974Se08).
		151.6245 *12*	100 *8*	0.0	5/2⁺	E1		0.0920	α(K)=0.0779 *11*; α(L)=0.01112 *16*; α(M)=0.00239 *4* α(N)=0.000541 *8*; α(O)=8.26×10^{-5} *12*; α(P)=6.88×10^{-6} *10* B(E1)(W.u.)=3.0×10^{-5} +*32*−*14* Mult.: From α_K(exp) (1974Se08).
172.85316	5/2⁺	69.67300 *13*	100.0 *10*	103.18017	3/2⁺	M1+E2	0.136 *4*	5.31	α(K)=4.39 *7*; α(L)=0.719 *12*; α(M)=0.1572 *25* α(N)=0.0358 *6*; α(O)=0.00555 *9*; α(P)=0.000485 *7* B(M1)(W.u.)=0.0700; B(E2)(W.u.)=141 δ: From 0.126 *8* (1962Su01) from α_K(exp) and L subshell ratios, 0.137 *1* (1965Ba37) from reanalysis of earlier L subshell ratio data, and 0.139 *7* (1969Sm04) from L subshell ratio data. Others: +0.085 *6* (1971Kr19) from $\gamma\gamma(\theta)$ and 1961Mo07, 1961Ru01, and 1970Me26; 1.55 +*26*−*20* from (n,γ).
		75.42213 *23*	4.1 *6*	97.43098	5/2⁻	E1+M2	0.055 *10*	0.76 *7*	α(K)=0.62 *5*; α(L)=0.112 *13*; α(M)=0.025 *3* α(N)=0.0056 *7*; α(O)=0.00083 *11*; α(P)=6.3×10^{-5} *9* B(E1)(W.u.)=2.47×10^{-5} I_γ: From ^{153}Sm β- decay. Others: 3.24 *10* (^{153}Gd ε decay) and 3.6 *4* (^{152}Eu(n,γ)). δ: From 0.055 *10* (1970Me26) from L_1/L_2 ratio and 0.055 *10* (1974Se08) from α_K(exp). B(M2)(W.u.)=60 overpasses RUL limit indicating that the M2 mixing could be overestimated.
		89.48595 *22*	3.3 *3*	83.36728	7/2⁺	M1+E2	0.25 *10*	2.60 *7*	α(K)=2.11 *5*; α(L)=0.38 *7*; α(M)=0.085 *16* α(N)=0.019 *4*; α(O)=0.0029 *5*; α(P)=0.000230 *7* B(M1)(W.u.)=0.00105; B(E2)(W.u.)=4.3

Adopted Levels, Gammas (continued)

$\gamma(^{153}Eu)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ[&]	α[@]	Comments
									δ: From 0.35 *5* (1974Se08) from α_K(exp) and 0.14 (value quoted in 1966Bl06) from L_1/L_3 ratio. I_γ: From ^{153}Sm β- decay. Others: 2.87 *17* (^{153}Gd ε decay) and 3.2 *3* (^{152}Eu(n,γ)).
172.85316	5/2$^+$	172.85307 *21*	1.56 *4*	0.0	5/2$^+$	M1+E2	0.81 *8*	0.377	α(K)=0.296 *7*; α(L)=0.0637 *22*; α(M)=0.0142 *6* α(N)=0.00321 *12*; α(O)=0.000477 *15*; α(P)=3.00×10^{-5} *10* B(M1)(W.u.)=4.4×10^{-5}; B(E2)(W.u.)=0.51 I_γ: From ^{153}Sm β- decay. Others: 1.49 *7* (^{153}Gd ε decay) and 1.7 *3* (^{152}Eu(n,γ)). δ: From 0.77 (quoted in 1966Bl06) and 0.85 *7* (1974Se08).
193.0654	9/2$^+$	109.6988 *8*	37.5 *16*	83.36728	7/2$^+$	M1+E2	0.63 *8*	1.51 *3*	α(K)=1.117 *22*; α(L)=0.303 *25*; α(M)=0.069 *6* α(N)=0.0154 *13*; α(O)=0.00224 *17*; α(P)=0.000114 *4* B(M1)(W.u.)=0.0115 *+21−18*; B(E2)(W.u.)=2.0×10^2 *+6−5* I_γ: From (d,3nγ). Others: 34.7 *26* (^{152}Eu(n,γ)), 39.7 *25* (Coulomb excitation), and 35 *7* (^{7}Li,4nγ). δ: From 0.69 *6* (1960Be16) and 0.58 *5* (1965As03) from α_K(exp) and 0.67 *10* (quoted in 1965As03).
		193.063 *3*	100 *3*	0.0	5/2$^+$	E2		0.242	B(E2)(W.u.)=112 *10* α(K)=0.1698 *24*; α(L)=0.0563 *8*; α(M)=0.01288 *18* α(N)=0.00288 *4*; α(O)=0.000408 *6*; α(P)=1.441×10^{-5} *21* Mult.: From K/L (1957Cl44).
235.2805	(9/2$^-$)	42.2147[b] *25*	1.9 *15*	193.0654	9/2$^+$				
		83.6567 *6*	83 *8*	151.6239	7/2$^-$	M1		3.9 *8*	α(K)=2.2 *4*; α(L)=1.29 *92*; α(M)=0.30 *22* α(N)=0.066 *48*; α(O)=0.0092 *63*; α(P)=2.11×10^{-4} *78* Mult.: From α(L1)exp in (n,γ) E=thermal.
		137.8498 *20*	7.8 *10*	97.43098	5/2$^-$				
		151.9135 *12*	100 *8*	83.36728	7/2$^+$	E1		0.0915	α(K)=0.0775 *11*; α(L)=0.01106 *16*; α(M)=0.00238 *4* α(N)=0.000538 *8*; α(O)=8.22×10^{-5} *12*; α(P)=6.84×10^{-6} *10*
269.7361	(7/2$^+$)	76.6703 *20*	0.59 *13*	193.0654	9/2$^+$				E_γ: Only reported in ^{152}Eu(n,γ).
		96.8830 *7*	100 *8*	172.85316	5/2$^+$	E2(+M1)		2.4 *4*	α(K)=1.49 *22*; α(L)=0.68 *44*; α(M)=0.16 *11* α(N)=0.035 *23*; α(O)=0.0049 *30*; α(P)=1.41×10^{-4} *48*
		118.1123 *10*	5.8 *5*	151.6239	7/2$^-$				I_γ: From ^{152}Eu(n,γ). Other: 2.4 *4* (^{153}Sm β- decay).
		166.5556 *15*	13.6 *10*	103.18017	3/2$^+$				I_γ: From ^{152}Eu(n,γ). Others: 8.4 *8* (^{153}Sm β- decay) and 8.3 (Coulomb excitation).
		172.3043 *20*	10.3 *10*	97.43098	5/2$^-$	E1		0.0652	α(K)=0.0553 *8*; α(L)=0.00782 *11*; α(M)=0.001682 *24* α(N)=0.000381 *6*; α(O)=5.84×10^{-5} *9*; α(P)=4.96×10^{-6} *7* I_γ: From ^{152}Eu(n,γ). Others: 5.6 (^{153}Sm β- decay) and 6.0 (Coulomb excitation).
321.8589	(11/2)$^-$	86.5783 *6*	100 *3*	235.2805	(9/2$^-$)	M1(+E2)	0.6 *+9−6*	3.5 *7*	α(K)=2.0 *4*; α(L)=1.11 *77*; α(M)=0.26 *19* α(N)=0.057 *41*; α(O)=0.0079 *53*; α(P)=1.93×10^{-4} *69* Mult.: from (n,γ) E=thermal.
		128.7936 *9*	53 *4*	193.0654	9/2$^+$	E1		0.1430	α(K)=0.1208 *17*; α(L)=0.01750 *25*; α(M)=0.00376 *6*

$\gamma(^{153}Eu)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[&]	α[@]	Comments
									α(N)=0.000850 *12*; α(O)=0.0001290 *18*; α(P)=1.044×10^{-5} *15* I_γ: From ^{152}Eu(n,γ).
321.8589	(11/2)$^-$	170.2344 *25*	29.5 *27*	151.6239	7/2$^-$	(E2)		0.371	α(K)=0.249 *4*; α(L)=0.0945 *14*; α(M)=0.0217 *3* α(N)=0.00485 *7*; α(O)=0.000681 *10*; α(P)=2.05×10^{-5} *3* I_γ: Average of values from ^{152}Eu(n,γ) and (d,3nγ). Other: 184 (^{150}Nd(^{7}Li,4nγ)). Mult.: from (n,γ) E=thermal.
325.0661	11/2$^+$	89.7863 *15*	12.0 *18*	235.2805	(9/2$^-$)				I_γ: From ^{152}Eu(n,γ). Other: 5.2 *2* (^{150}Nd(^{7}Li,4nγ)).
		132.0008 *10*	13.8 *14*	193.0654	9/2$^+$	M1		0.837	α(K)=0.709 *10*; α(L)=0.1010 *15*; α(M)=0.0218 *3* α(N)=0.00500 *7*; α(O)=0.000793 *11*; α(P)=7.83×10^{-5} *11* B(M1)(W.u.)=0.0171 *+39−33*
		241.6974 *25*	100 *7*	83.36728	7/2$^+$	E2		0.1154	α(K)=0.0856 *12*; α(L)=0.0232 *4*; α(M)=0.00525 *8* α(N)=0.001178 *17*; α(O)=0.0001700 *24*; α(P)=7.64×10^{-6} *11* B(E2)(W.u.)=182 *+21−19*
396.4028	(9/2$^+$)	74.5451[ab] *12*	≤2.1[a]	321.8589	(11/2)$^-$				
		126.6664 *10*	100 *8*	269.7361	(7/2$^+$)	M1(+E2)	0.3 *+13−3*	0.99 *5*	α(K)=0.70 *10*; α(L)=0.22 *12*; α(M)=0.051 *27* α(N)=0.0115 *59*; α(O)=0.00164 *75*; α(P)=6.7×10^{-5} *21*
		161.128 *12*	3.8 *21*	235.2805	(9/2$^-$)				
		223.545 *3*	47 *4*	172.85316	5/2$^+$	E2		0.1489	α(K)=0.1085 *16*; α(L)=0.0314 *5*; α(M)=0.00714 *10* α(N)=0.001598 *23*; α(O)=0.000229 *4*; α(P)=9.52×10^{-6} *14*
		244.777 *4*	45 *3*	151.6239	7/2$^-$	E1		0.0258	α(K)=0.0219 *3*; α(L)=0.00304 *5*; α(M)=0.000652 *10* α(N)=0.0001481 *21*; α(O)=2.29×10^{-5} *4*; α(P)=2.04×10^{-6} *3*
403.289?		305.87[b] *4*	100	97.43098	5/2$^-$				
442.622?	($^+$)	39.3324[b] *25*	100 *16*	403.289?					
		172.887[b] *5*	18 *4*	269.7361	(7/2$^+$)	M1		0.393	α(K)=0.333 *5*; α(L)=0.0472 *7*; α(M)=0.01020 *15* α(N)=0.00234 *4*; α(O)=0.000371 *6*; α(P)=3.68×10^{-5} *6*
		249.558[b] *5*	94 *10*	193.0654	9/2$^+$				
448.1384?		123.0724[b] *9*	100 *19*	325.0661	11/2$^+$				
		255.103[b] *20*	16 *3*	193.0654	9/2$^+$				
477.9272	(13/2$^-$)	152.862 *4*	17 *5*	325.0661	11/2$^+$				
		156.0674 *12*	100 *9*	321.8589	(11/2)$^-$	D(+Q)	+0.18 *6*		Mult.,δ: From (d,3nγ).
		242.645 *4*	69 *10*	235.2805	(9/2$^-$)	(E2)		0.1140	α(K)=0.0846 *12*; α(L)=0.0228 *4*; α(M)=0.00517 *8* α(N)=0.001160 *17*; α(O)=0.0001675 *24*; α(P)=7.55×10^{-6} *11* Mult.: From ^{152}Eu(n,γ).
481.0512	13/2$^+$	155.9849 *20*	9.2 *9*	325.0661	11/2$^+$				I_γ: From ^{152}Eu(n,γ). Other: 17.5 *4* (^{150}Nd(^{7}Li,4nγ)).

$^{153}_{63}Eu_{90}$-12

γ(^{153}Eu) (continued)

E_i(level)	J^π_i	E_γ †	I_γ ‡	E_f	J^π_f	Mult.#	α@	Comments
481.0512	13/2+	159.1908 *20*	15.3 *15*	321.8589	(11/2)−	D		
		287.993 *5*	100 *8*	193.0654	9/2+	E2	0.0661	α(K)=0.0507 *7*; α(L)=0.01201 *17*; α(M)=0.00270 *4* α(N)=0.000608 *9*; α(O)=8.89×10^{-5} *13*; α(P)=4.68×10^{-6} *7* B(E2)(W.u.)=226 *14* Mult.: From (^{7}Li,4nγ) and ^{152}Eu(n,γ).
537.9413	(11/2+)	141.5381 *10*	100 *8*	396.4028	(9/2+)	M1	0.688	α(K)=0.582 *9*; α(L)=0.0829 *12*; α(M)=0.0179 *3* α(N)=0.00410 *6*; α(O)=0.000651 *10*; α(P)=6.43×10^{-5} *9*
		216.086 *5*	15 *4*	321.8589	(11/2)−			
		268.205 *5*	100 *7*	269.7361	(7/2+)	E2	0.0827	α(K)=0.0626 *9*; α(L)=0.01562 *22*; α(M)=0.00353 *5* α(N)=0.000792 *11*; α(O)=0.0001152 *17*; α(P)=5.70×10^{-6} *8*
		302.660 *6*	93 *8*	235.2805	(9/2−)			
552.4727?		74.5451[ab] *12*	≤17[a]	477.9272	(13/2−)			
		104.3352[b] *15*	9.0 *24*	448.1384?				
		359.427[b] *15*	100 *24*	193.0654	9/2+			
559.7390		111.6004[b] *12*	59 *9*	448.1384?				
		237.889[b] *12*	100 *33*	321.8589	(11/2)−			
569.31	(7/2+)	472.2 *5*	37 *5*	97.43098	5/2−			I_γ: Only reported in (d,3nγ).
		485.8 *2*	26 *8*	83.36728	7/2+			I_γ: From Coulomb excitation. Others: 39 *13* (d,3nγ) and 21.9 *9* (n,n′γ).
		569.4 *2*	100	0.0	5/2+			
585.02		412.05 *20*	100	172.85316	5/2+			
		487.75 *23*	17	97.43098	5/2−			
589.34	(15/2−)	108.3 *7*	5.2 *10*	481.0512	13/2+			E_γ: The γ′s of 186.2 and 319.7 assigned in ^{152}Eu(n,γ) from this level have not been adopted. I_γ: From (^{7}Li,4nγ). Other: 8.6 *29* (d,3nγ).
		111.44 *12*	33.4 *7*	477.9272	(13/2−)			I_γ: From (^{7}Li,4nγ). Other: 55.7 *23* (d,3nγ).
		267.5 *7*	100 *1*	321.8589	(11/2)−			
617.18	(5/2+)	533.6 *4*	100 *5*	83.36728	7/2+			
		617.3 *3*	75.0 *13*	0.0	5/2+			I_γ: From (n,n′γ). Other: 143 *25* (Coul. ex.).
634.62	(1/2+)	462.0 *3*	2.9 *5*	172.85316	5/2+			
		531.40 *6*	100 *2*	103.18017	3/2+			
		634.8 *3*	0.96 *11*	0.0	5/2+			
636.516	3/2−	463.64 *5*	45.4 *19*	172.85316	5/2+			I_γ: From ^{153}Sm β- decay. Others: 22.4 *10* (^{153}Eu(n,n′γ)) and 34 *7* (^{152}Eu(n,γ)).
		533.372 *25*	100 *2*	103.18017	3/2+			
		539.04 *3*	70.5 *19*	97.43098	5/2−			
		636.4 *2*	6.4 *4*	0.0	5/2+			I_γ: From ^{153}Sm β- decay. Other: 12.8 *20* (^{153}Eu(n,n′γ)).
641.587		81.8476[b] *25*	35 *5*	559.7390				
		198.967[b] *4*	100 *20*	442.622?	(+)			
654.700	(15/2+)	173.640 *10*	43 *4*	481.0512	13/2+			I_γ: From (^{7}Li,4nγ). Other: 5.7 *14* ^{152}Eu(n,γ).
		176.7 *6*	34 *4*	477.9272	(13/2−)			I_γ: Only reported in (^{7}Li,4nγ).

$^{153}_{63}$Eu$_{90}$-13

$\gamma(^{153}Eu)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[@]	Comments
654.700	(15/2$^+$)	329.652 *15*	100 *3*	325.0661	11/2$^+$	E2	0.0436	α(K)=0.0342 *5*; α(L)=0.00741 *11*; α(M)=0.001658 *24* α(N)=0.000374 *6*; α(O)=5.52×10^{-5} *8*; α(P)=3.23×10^{-6} *5* B(E2)(W.u.)=164 *+14−12* Mult.: From (^{7}Li,4nγ) and (d,3nγ).
657.68?		485.0[b] *2*	100 *8*	172.85316	5/2$^+$			
		574.1[b] *3*	41 *13*	83.36728	7/2$^+$			
		657.55[ab] *25*	≤110[a]	0.0	5/2$^+$			
681.90	(5/2$^-$)	412.05 *20*	58.6 *15*	269.7361	(7/2$^+$)			
		509.02 *12*	61 *5*	172.85316	5/2$^+$			
		578.67 *9*	100 *3*	103.18017	3/2$^+$			
		584.59 *10*	32.2 *8*	97.43098	5/2$^-$			I_γ: From ^{153}Sm β- decay. Other: 54 *3* (^{153}Eu(n,n′γ)).
		598.3[a] *3*	≤62[a]	83.36728	7/2$^+$			
		682.0 *6*	4 *4*	0.0	5/2$^+$			I_γ: From ^{153}Sm β- decay. Other: 52 *5* (^{153}Eu(n,n′γ)).
694.185	5/2$^+$	424.51 *11*	17.3 *5*	269.7361	(7/2$^+$)			
		521.37 *3*	63.1 *24*	172.85316	5/2$^+$			
		542.0 *6*	29 *8*	151.6239	7/2$^-$			E_γ: Values are discrepant; 542.7 *2* (^{153}Sm β- decay) and 541.42 *24* (n,n′γ). I_γ: From ^{153}Sm β- decay. Other: 40 *8* (^{153}Eu(n,n′γ)).
		590.96 *20*	10.8 *5*	103.18017	3/2$^+$			
		596.61 *10*	100 *3*	97.43098	5/2$^-$			
		694.1 *3*	0.19 *5*	0.0	5/2$^+$			
701.39		598.3[ab] *3*	≤46[a]	103.18017	3/2$^+$			
		603.6[b] *4*	100 *3*	97.43098	5/2$^-$			I_γ: May be a multiplet in ^{153}Sm β- decay.
		617.9 *3*	16 *3*	83.36728	7/2$^+$			
		701.8 *4*	0.65 *13*	0.0	5/2$^+$			
706.629	5/2$^+$	437.13 *10*	10.2 *10*	269.7361	(7/2$^+$)			I_γ: From ^{153}Sm β- decay. Other: 14.0 *10* (^{153}Eu(n,n′γ)).
		554.92 *10*	37.2 *7*	151.6239	7/2$^-$			I_γ: From ^{153}Sm β- decay. Others: 38.9 *16* (^{153}Eu(n,n′γ)) and 85 *17* (^{152}Eu(n,γ)).
		603.31 *10*	35.1 *9*	103.18017	3/2$^+$			I_γ: From ^{153}Sm β- decay. Others: 16.9 *15* (^{153}Eu(n,n′γ)) and 36 *9* (^{152}Eu(n,γ)).
		609.15 *7*	100 *8*	97.43098	5/2$^-$			I_γ: May be a multiplet in ^{153}Sm β- decay.
		706.8 *5*	0.12 *1*	0.0	5/2$^+$			
711.1	(9/2$^+$)	518.3 *10*	61 *4*	193.0654	9/2$^+$			I_γ: From (n,n′γ). Other: 108 *25* (Coul. ex.),
		628.1 *7*	100 *4*	83.36728	7/2$^+$			
		710.2[b] *10*		0.0	5/2$^+$			
713.11	(3/2$^+$)	443.2 *5*	0.69 *11*	269.7361	(7/2$^+$)			
		609.5 *3*	100 *6*	103.18017	3/2$^+$			I_γ: May be a multiplet in ^{153}Sm β- decay.
		615.8[a] *4*	≤5.5[a]	97.43098	5/2$^-$			
		630.5 *4*	0.78 *11*	83.36728	7/2$^+$			
716.173	(13/2$^+$)	178.229 *7*	65 *12*	537.9413	(11/2$^+$)			I_γ: From (d,3nγ). Others: 50 *17* in ^{152}Eu(n,γ) and 140 *41* in (^{7}Li,4nγ).

From ENSDF

$^{153}_{63}Eu_{90}$-14

$\gamma(^{153}Eu)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[&]	α[@]	Comments
716.173	(13/2+)	319.784 *14*	100 *22*	396.4028	(9/2+)				
		394.1 *4*	81 *15*	321.8589	(11/2)−				I_γ: From (d,3nγ). Other: 33 *8* from (^{7}Li,4nγ).
718.69	(3/2+)	545.75 *15*	100 *4*	172.85316	5/2+				
		615.8 *4*	67 *5*	103.18017	3/2+				I_γ: From (n,n′γ); doublet in β- decay.
		719.0 *4*	3.3 *7*	0.0	5/2+				
732.52	(7/2+)	539.38 *11*	100 *8*	193.0654	9/2+				
		649.24 *24*	15 *3*	83.36728	7/2+				
		732.60 *11*	64 *3*	0.0	5/2+				
760.39		124.9 *4*	100	634.62	(1/2+)				
		587.60 *25*	5.6 *6*	172.85316	5/2+				
		657.55[ab] *25*	≤4.6[a]	103.18017	3/2+				
		662.4 *6*	0.23 *6*	97.43098	5/2−				
		677.0 *3*	0.48 *16*	83.36728	7/2+				
		760.5 *4*	0.35 *6*	0.0	5/2+				
763.8?		763.8[b] *6*	100	0.0	5/2+				
788.94	1/2+	685.76 *10*	100	103.18017	3/2+				
797.146		90.5152[b] *15*	100 *12*	706.629	5/2+				
		102.9576[b] *17*	65 *15*	694.185	5/2+				
825.39	(17/2−)	170.2 *6*	7.0 *4*	654.700	(15/2+)	(D)			I_γ: From (^{7}Li,4nγ).
		236.07 *12*	100 *7*	589.34	(15/2−)	D(+Q)	+0.18 *8*		Mult.,δ: From (d,3nγ).
		347.7 *3*	82 *7*	477.9272	(13/2−)	E2		0.0372	α(K)=0.0293 *5*; α(L)=0.00616 *9*; α(M)=0.001375 *20* α(N)=0.000310 *5*; α(O)=4.60×10^{-5} *7*; α(P)=2.79×10^{-6} *4* B(E2)(W.u.)=196 *+36−31* I_γ: From (d,3nγ). Other: 117 *3* (^{7}Li,4nγ). Mult.: From (^{7}Li,4nγ) and (d,3nγ).
827.42	(7/2+)	557.73 *10*	87 *4*	269.7361	(7/2+)				
		634.62 *18*	45 *6*	193.0654	9/2+				
		729.82 *10*	100 *4*	97.43098	5/2−				
		827.6 *2*	77 *5*	0.0	5/2+				
840.58	(3/2+)	667.65 *12*	100 *7*	172.85316	5/2+				
		737.42 *22*	33 *4*	103.18017	3/2+				
		757.4 *2*	48 *5*	83.36728	7/2+				
851.7	(17/2+)	196.4 *6*	10.6 *10*	654.700	(15/2+)				
		263.2 *7*	≤1.3	589.34	(15/2−)				
		370.6 *4*	100 *7*	481.0512	13/2+	E2		0.0308	α(K)=0.0245 *4*; α(L)=0.00496 *8*; α(M)=0.001104 *16* α(N)=0.000249 *4*; α(O)=3.71×10^{-5} *6*; α(P)=2.35×10^{-6} *4* B(E2)(W.u.)=245 *15* Mult.: From (^{7}Li,4nγ) and (d,3nγ).
876.67	(9/2+)	551.32 *17*	30 *4*	325.0661	11/2+				
		683.94 *10*	31 *6*	193.0654	9/2+				
		793.1 *1*	100 *6*	83.36728	7/2+				
		876.4 *3*	13 *4*	0.0	5/2+				

$^{153}_{63}Eu_{90}$-15

$\gamma(^{153}Eu)$ (continued)

E_i(level)	J^{π}_i	E_{γ}†	I_{γ}‡	E_f	J^{π}_f	Mult.#	α@	Comments
891.3	(15/2+)	175.6 *6*	46 *3*	716.173	(13/2+)			
		353.2 *7*	100 *3*	537.9413	(11/2+)			
		413.1 *7*	94 *26*	477.9272	(13/2−)			
942.6		353.3	100	589.34	(15/2−)			
954.5	(19/2−)	102.6 *7*	1.06 *13*	851.7	(17/2+)			
		129.5 *7*	13.8 *5*	825.39	(17/2−)			
		364.9 *7*	100 *2*	589.34	(15/2−)	Q		
1061.6	(19/2+)	209.6 *7*	12.5 *23*	851.7	(17/2+)			I_{γ}: From (^{7}Li,4nγ). Other: 3.4 *10* (Coul.ex.).
		236.8 *6*	18.5 *6*	825.39	(17/2−)	[E1]		B(E1)(W.u.)=4.5×10^{-4} *+11−8* I_{γ}: From (^{7}Li,4nγ). Other: 13.5 *17* (Coul.ex.).
		406.4 *7*	100 *6*	654.700	(15/2+)	E2	0.0236	α(K)=0.0190 *3*; α(L)=0.00365 *6*; α(M)=0.000811 *13* α(N)=0.000183 *3*; α(O)=2.75×10^{-5} *5*; α(P)=1.85×10^{-6} *3* B(E2)(W.u.)=143 *+25−20*
1114.1	(17/2+)	222.5		891.3	(15/2+)			
		397.5 *7*		716.173	(13/2+)			
		524.8		589.34	(15/2−)			
1156.9		1156 *1*	100	0.0	5/2+			
1177.2	5/2	1094 *1*	33 *4*	83.36728	7/2+			
		1177 *1*	100	0.0	5/2+			
1262.7	(21/2−)	200.9 *6*	3.8 *7*	1061.6	(19/2+)	[E1]		B(E1)(W.u.)=3.5×10^{-4} *+20−13*
		309.2 *7*	62 *5*	954.5	(19/2−)			I_{γ}: From (^{7}Li,4nγ). Other: 33 *11* (d,3nγ).
		436.8 *7*	100 *2*	825.39	(17/2−)	(E2)	0.0193	α(K)=0.01559 *23*; α(L)=0.00290 *5*; α(M)=0.000642 *10* α(N)=0.0001452 *22*; α(O)=2.19×10^{-5} *4*; α(P)=1.532×10^{-6} *23* B(E2)(W.u.)=2.3×10^{2} *+8−5*
1293.9	(21/2+)	232.3 *6*	9 *4*	1061.6	(19/2+)			I_{γ}: From (^{7}Li,4nγ). Other: 3.8 *8* (Coul. ex.).
		339.0 *7*	45 *7*	954.5	(19/2−)	[E1]		B(E1)(W.u.)=7.5×10^{-4} *+15−14* I_{γ}: From (^{7}Li,4nγ). Other: 11 *2* (Coul. ex.).
		442.1 *7*	100 *2*	851.7	(17/2+)	E2	0.0187	α(K)=0.01510 *22*; α(L)=0.00279 *5*; α(M)=0.000618 *10* α(N)=0.0001398 *21*; α(O)=2.11×10^{-5} *4*; α(P)=1.485×10^{-6} *22* B(E2)(W.u.)=189 *+25−21*
1314.2	(19/2+)	200.0	100 *18*	1114.1	(17/2+)			
		423.7	82 *14*	891.3	(15/2+)			
		489.7	47 *6*	825.39	(17/2−)			
1404.8	(23/2−)	110.		1293.9	(21/2+)			
		142.0 *7*	42 *7*	1262.7	(21/2−)	D		
		450.2 *7*	100.0 *15*	954.5	(19/2−)	Q		
1534.9	(23/2+)	241.3		1293.9	(21/2+)			
		271.9 *7*	5.1 *9*	1262.7	(21/2−)	D		
		473.2 *7*	100 *7*	1061.6	(19/2+)	Q		
1575.0	(21/2+)	261.6 *7*	54 *10*	1314.2	(19/2+)			
		460.4 *7*	100 *12*	1114.1	(17/2+)			
		619.8 *9*	49 *12*	954.5	(19/2−)			
1771.0	(19/2−)	477.0 *4*		1293.9	(21/2+)			

Adopted Levels, Gammas (continued)

$\gamma(^{153}Eu)$ (continued)

E_i(level)	J^π_i	E_γ †	I_γ ‡	E_f	J^π_f	Mult.#	α@	Comments
1771.0	(19/2⁻)	709.4 *4*		1061.6	(19/2⁺)			
		919.4 *4*		851.7	(17/2⁺)	E1	1.27×10^{-3}	α(K)=0.001090 *16*; α(L)=0.0001416 *20*; α(M)=3.03×10^{-5} *5* α(N)=6.91×10^{-6} *10*; α(O)=1.094×10^{-6} *16*; α(P)=1.088×10^{-7} *16*
1772.1	(25/2⁻)	237.3		1534.9	(23/2⁺)			
		367.2 *7*	13.0 *7*	1404.8	(23/2⁻)	D		
		509.6 *8*	100 *9*	1262.7	(21/2⁻)	Q		
1796.3	(23/2⁺)	222.2		1575.0	(21/2⁺)			
		481.9 *8*	100 *12*	1314.2	(19/2⁺)			
		534.8 *9*	81 *12*	1262.7	(21/2⁻)			
1798.4	(25/2⁺)	263.2 *7*	≤5.1	1534.9	(23/2⁺)			
		393.9	≤16.8	1404.8	(23/2⁻)			
		504.9	100 *14*	1293.9	(21/2⁺)	Q		
1925.9	(27/2⁻)	127.4		1798.4	(25/2⁺)			
		154.1 *7*	19.8 *24*	1772.1	(25/2⁻)			
		520.8 *8*	100 *4*	1404.8	(23/2⁻)	Q		
1971.1	(21/2⁻)	200.1 *4*	100	1771.0	(19/2⁻)			
2065.6	(27/2⁺)	267.8		1798.4	(25/2⁺)			
		293.2 *7*	43 *13*	1772.1	(25/2⁻)			
		530.9 *8*	100 *9*	1534.9	(23/2⁺)	Q		
2082.8	(25/2⁺)	287.6 *7*		1796.3	(23/2⁺)			
		507.2 *8*		1575.0	(21/2⁺)			
		677.		1404.8	(23/2⁻)			
2182.3	(23/2⁻)	211.2 *4*		1971.1	(21/2⁻)			
		411.3 *4*		1771.0	(19/2⁻)			
2295.0		2295 *1*	100	0.0	5/2⁺			
2324.0		2324 *1*	100	0.0	5/2⁺			
2337.8	(29/2⁻)	271.7 *7*	24 *4*	2065.6	(27/2⁺)			
		412.3 *7*	77 *23*	1925.9	(27/2⁻)			
		565.6 *8*	100 *23*	1772.1	(25/2⁻)			
2346.0		2346 *1*	100	0.0	5/2⁺			
2355.4	(29/2⁺)	290.8 *7*	12 *6*	2065.6	(27/2⁺)			
		429.3 *7*	47 *2*	1925.9	(27/2⁻)	D		
		556.9 *8*	100 *4*	1798.4	(25/2⁺)	Q		
2369.0		2369 *1*		0.0	5/2⁺			
2401.6	(25/2⁻)	219.3 *4*		2182.3	(23/2⁻)			
		430.5 *4*		1971.1	(21/2⁻)			
2501.0	(31/2⁻)	146.5 *7*	2.6 *4*	2355.4	(29/2⁺)			
		162.9 *6*	5.2 *4*	2337.8	(29/2⁻)			
		574.9 *8*	100 *10*	1925.9	(27/2⁻)	Q		
2561.0		2561 *1*	100	0.0	5/2⁺			
2626.9	(27/2⁻)	225.2 *4*		2401.6	(25/2⁻)			
		444.5 *4*		2182.3	(23/2⁻)			
2630.0		2630 *1*	100	0.0	5/2⁺			

$^{153}_{63}Eu_{90}$-17

γ(^{153}Eu) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]
2646.2	(31/2$^+$)	291.0		2355.4	(29/2$^+$)	
		308.7		2337.8	(29/2$^-$)	
		580.2 *8*		2065.6	(27/2$^+$)	Q
2648.0		2648 *1*	100	0.0	5/2$^+$	
2697.0		2697 *1*	100	0.0	5/2$^+$	
2724.0	(29/2$^+$)	641.3 *9*		2082.8	(25/2$^+$)	
		797.9		1925.9	(27/2$^-$)	
2730.0		2730 *1*	100	0.0	5/2$^+$	
2761.2		2664 *1*	102 *22*	97.43098	5/2$^-$	
		2761 *1*	100	0.0	5/2$^+$	
2837.0		2837 *1*	100	0.0	5/2$^+$	
2859.0	(29/2$^-$)	232.0 *4*		2626.9	(27/2$^-$)	
		457.6 *4*		2401.6	(25/2$^-$)	
2878.0		2878 *1*	100	0.0	5/2$^+$	
2891.0		2891 *1*	100	0.0	5/2$^+$	
2930.1	(33/2$^-$)	284.1		2646.2	(31/2$^+$)	
		429.3 *7*	43 *2*	2501.0	(31/2$^-$)	D
		592.1 *9*	100 *30*	2337.8	(29/2$^-$)	
2957.3	(33/2$^+$)	310.8 *7*	7 *3*	2646.2	(31/2$^+$)	
		456.9 *7*	15.2 *17*	2501.0	(31/2$^-$)	D
2957.3	(33/2$^+$)	601.2 *9*	100 *31*	2355.4	(29/2$^+$)	Q
3101.5	(35/2$^-$)	145.4		2957.3	(33/2$^+$)	
		170.9		2930.1	(33/2$^-$)	
		600.1 *9*		2501.0	(31/2$^-$)	
3267.5	(35/2$^+$)	309.6 *7*	12 *3*	2957.3	(33/2$^+$)	
		338.2		2930.1	(33/2$^-$)	
		621.6 *9*	100 *15*	2646.2	(31/2$^+$)	Q
3445.9	(37/2$^-$)	344.7		3101.5	(35/2$^-$)	
		515.5		2930.1	(33/2$^-$)	
3594.1	(37/2$^+$)	636.8	100	2957.3	(33/2$^+$)	
3665.8	(39/2$^-$)	564.3	100	3101.5	(35/2$^-$)	
3736.5	(39/2$^-$)	635.0 *9*	100	3101.5	(35/2$^-$)	Q
3918.4	(39/2$^+$)	650.9 *9*	100	3267.5	(35/2$^+$)	
3979.6	(41/2$^-$)	533.7	100	3445.9	(37/2$^-$)	
4234.4	(43/2$^-$)	568.6	100	3665.8	(39/2$^-$)	
4251.9	(41/2$^+$)	657.8	100	3594.1	(37/2$^+$)	
4426.9	(43/2$^-$)	690.3 *10*	100	3736.5	(39/2$^-$)	
4584.2	(43/2$^+$)	665.8	100	3918.4	(39/2$^+$)	
4599.2	(45/2$^-$)	619.6	100	3979.6	(41/2$^-$)	
4928.6	(45/2$^+$)	676.7	100	4251.9	(41/2$^+$)	

† From all available sources; precise values are from curved-crystal measurements for ^{153}Sm β- and ^{153}Gd ε decay and ^{152}Eu(n,γ) which have been adjusted to the scale on which the main γ from ^{198}Au has an energy of 411.80205 *17* keV.

‡ From all available data; significant differences between different production modes are noted.

From (^{7}Li,4nγ) unless otherwise stated.

@ Additional information 1.

& If No value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.

a Multiply placed with undivided intensity.

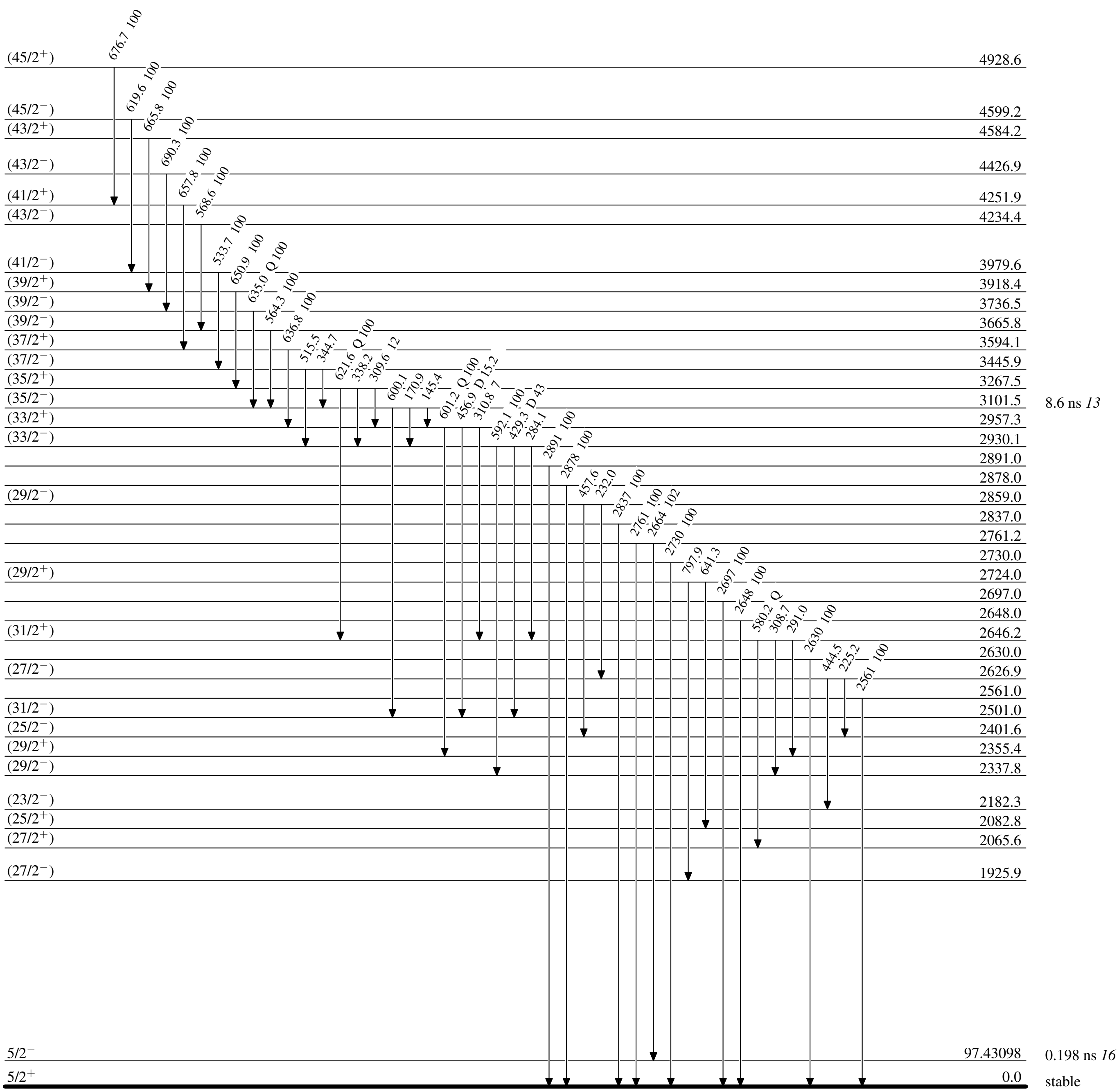
b Placement of transition in the level scheme is uncertain.

$^{153}_{63}$Eu$_{90}$-18

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

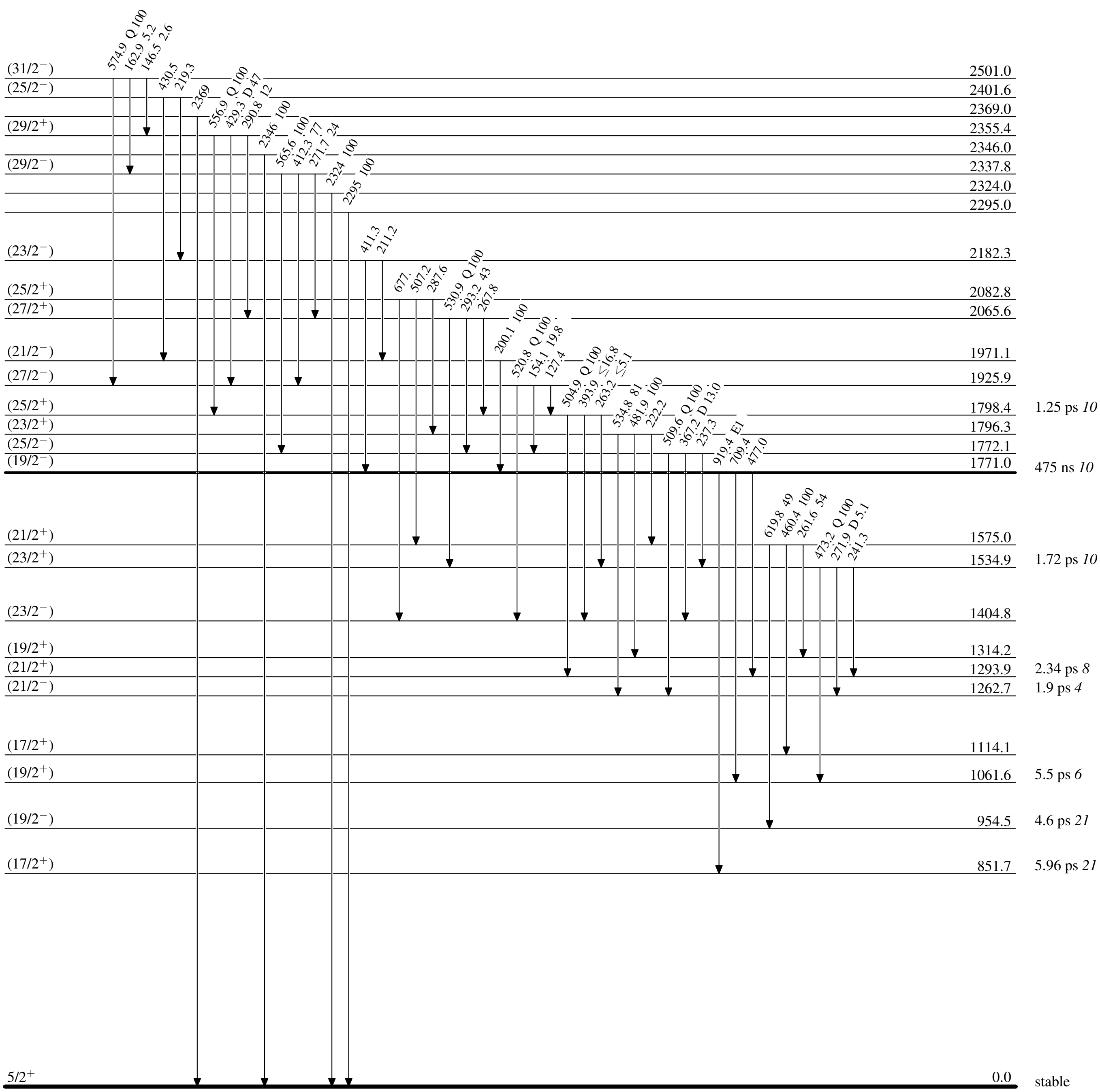


$^{153}_{63}Eu_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

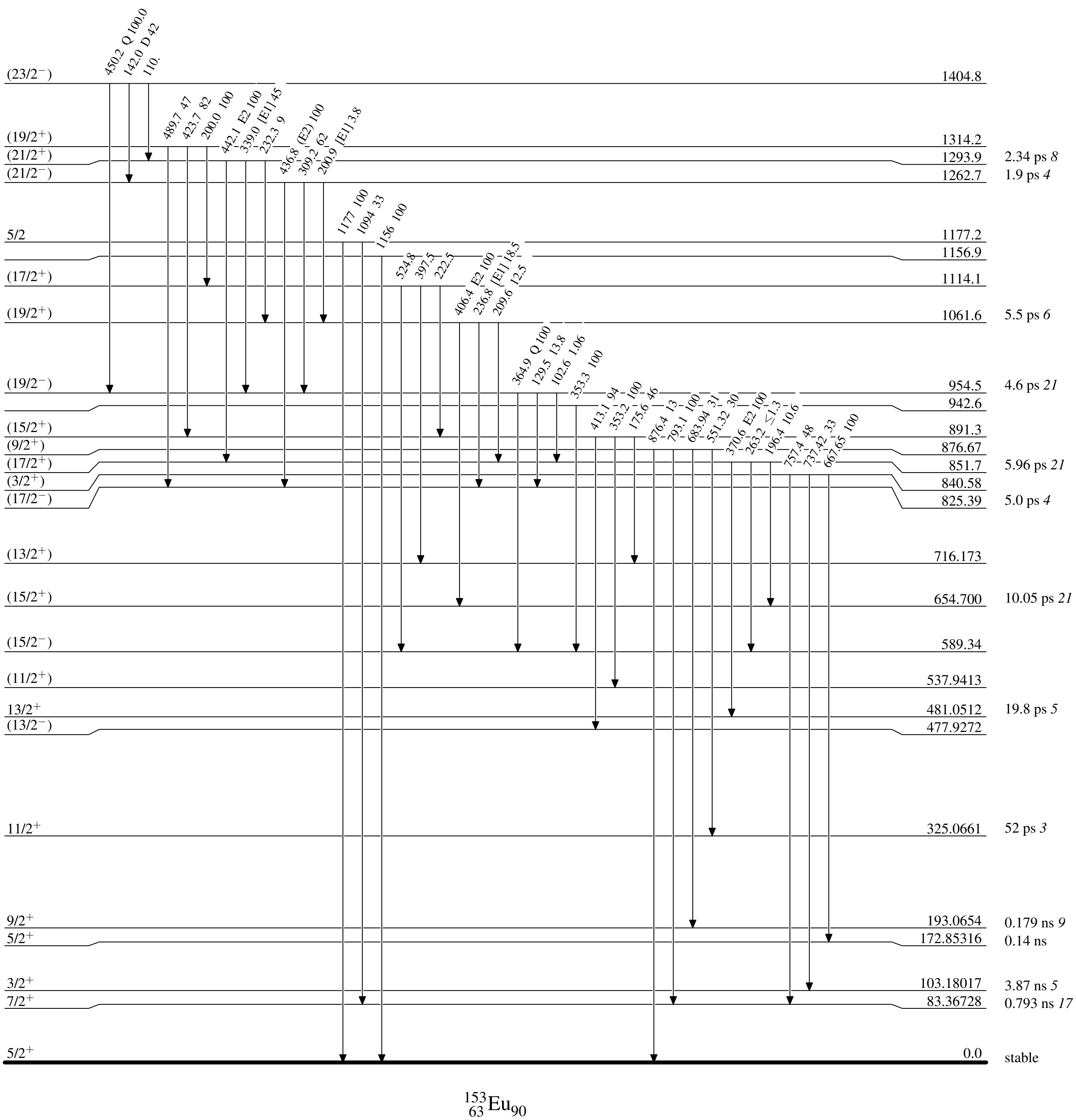


$^{153}_{63}Eu_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

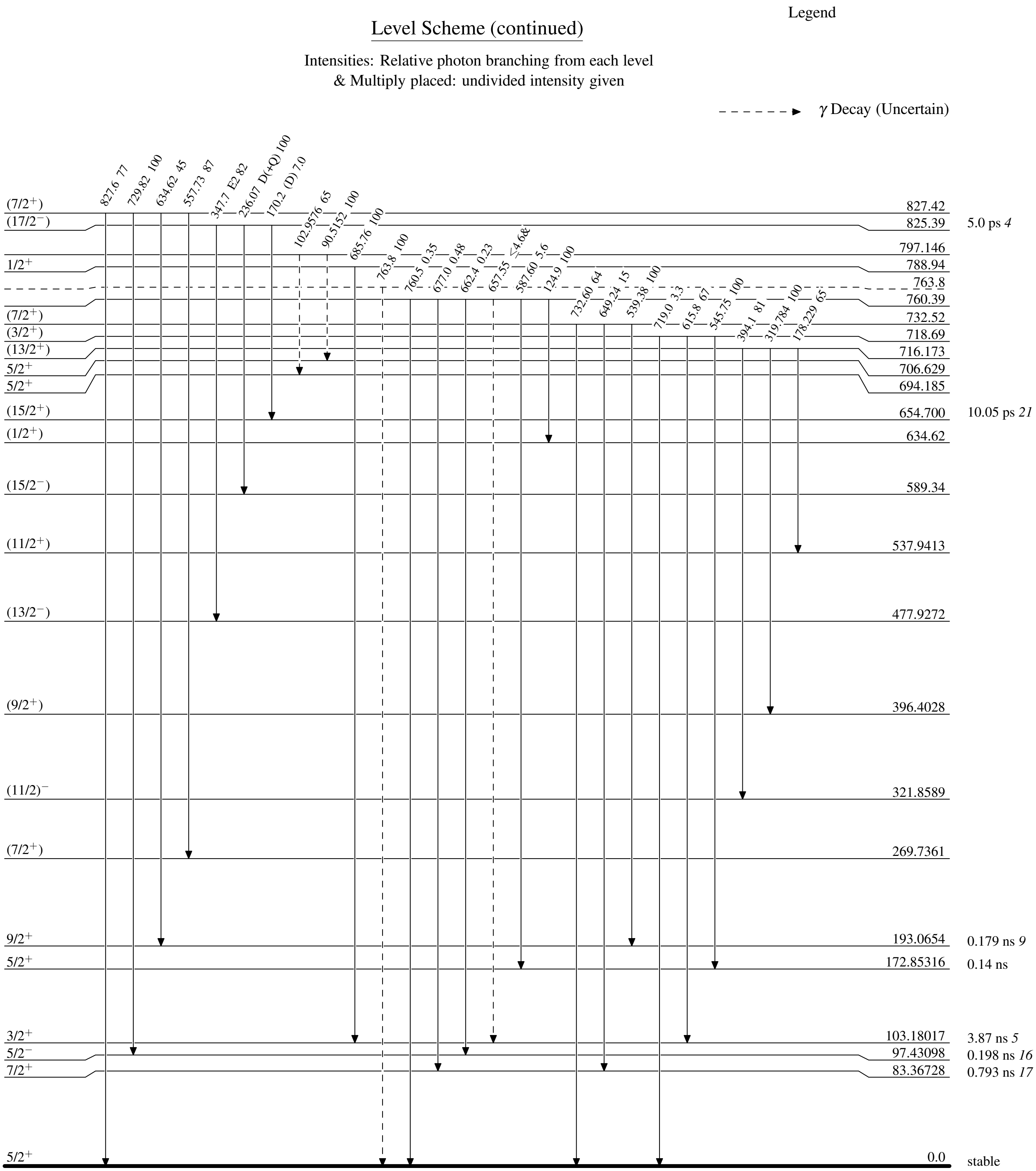
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

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

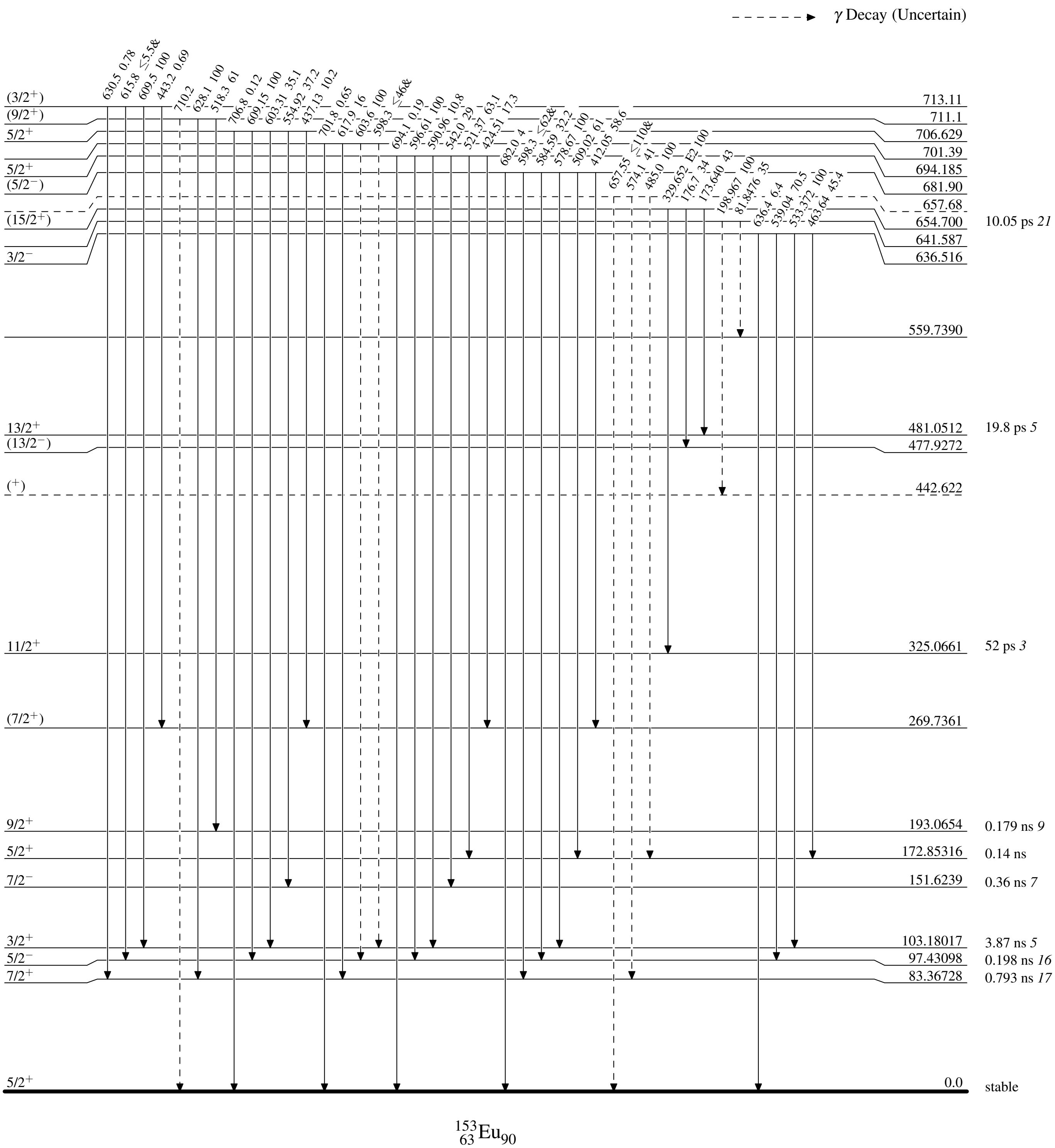


$^{153}_{63}Eu_{90}$

Adopted Levels, Gammas

Level Scheme (continued)

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

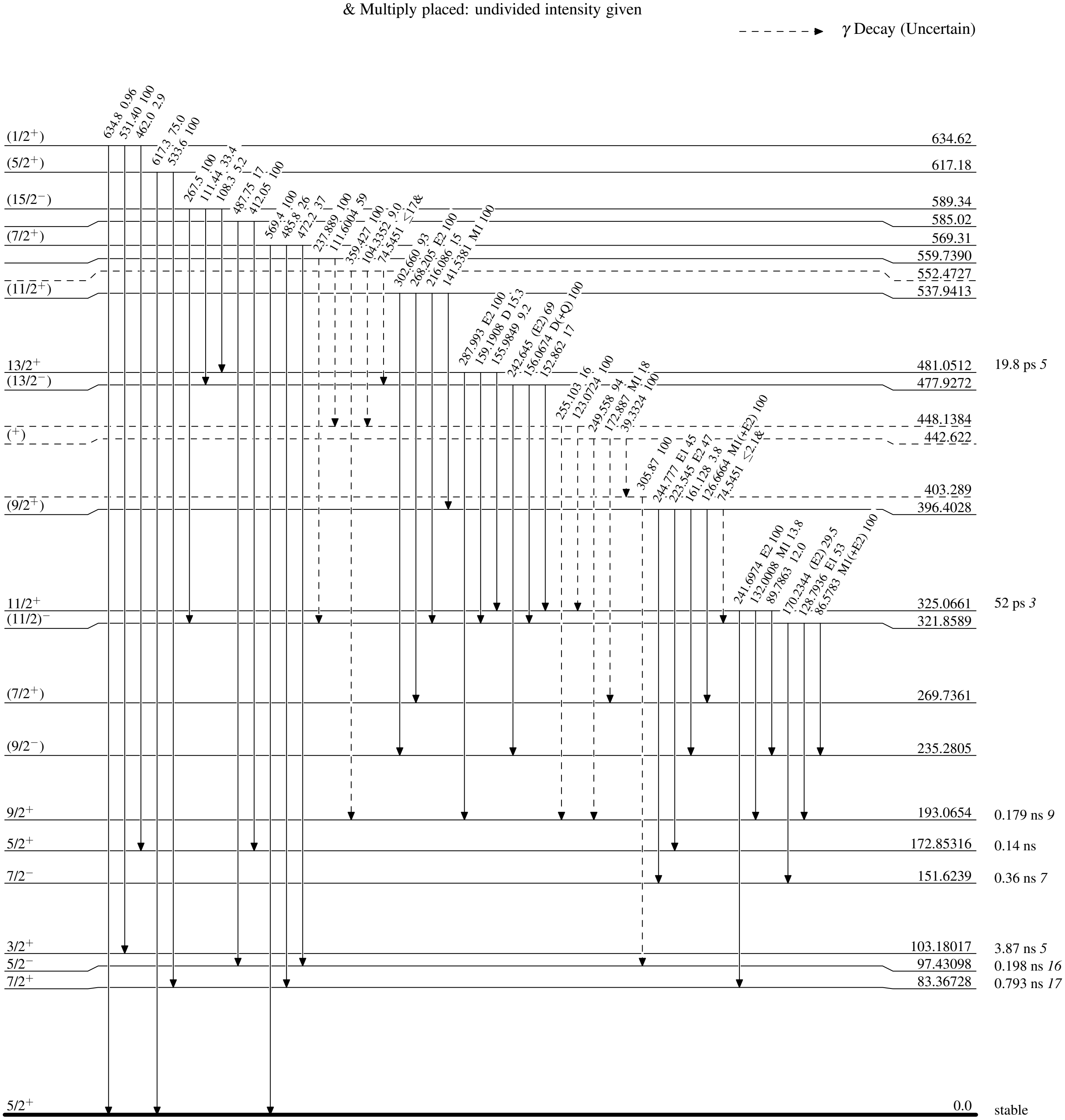


Adopted Levels, Gammas

Level Scheme (continued)

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

Legend



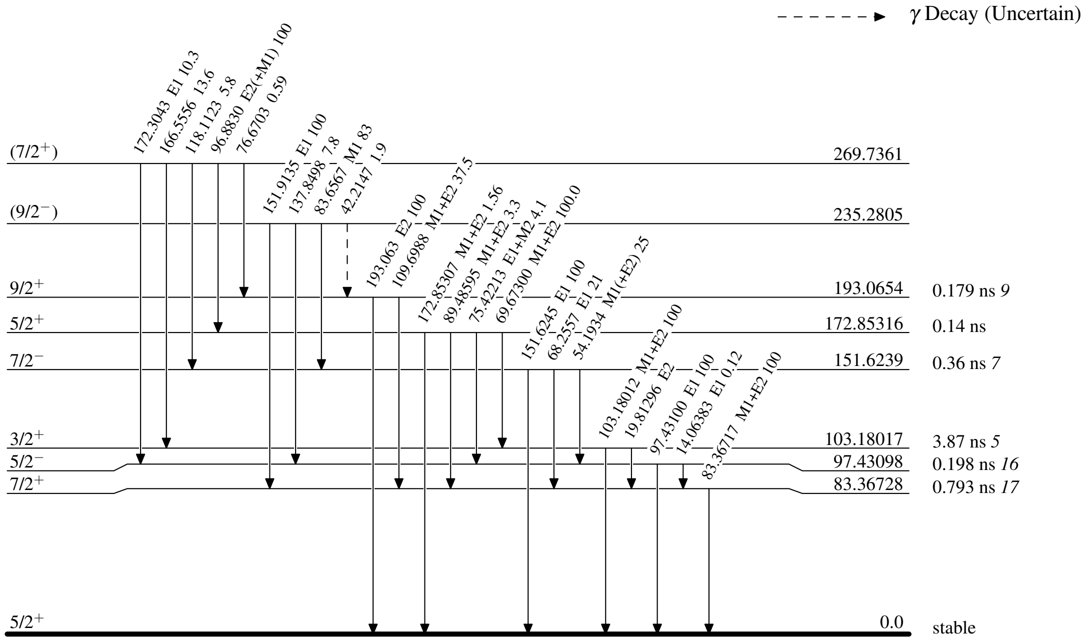
$^{153}_{63}Eu_{90}$

Adopted Levels, Gammas

Legend

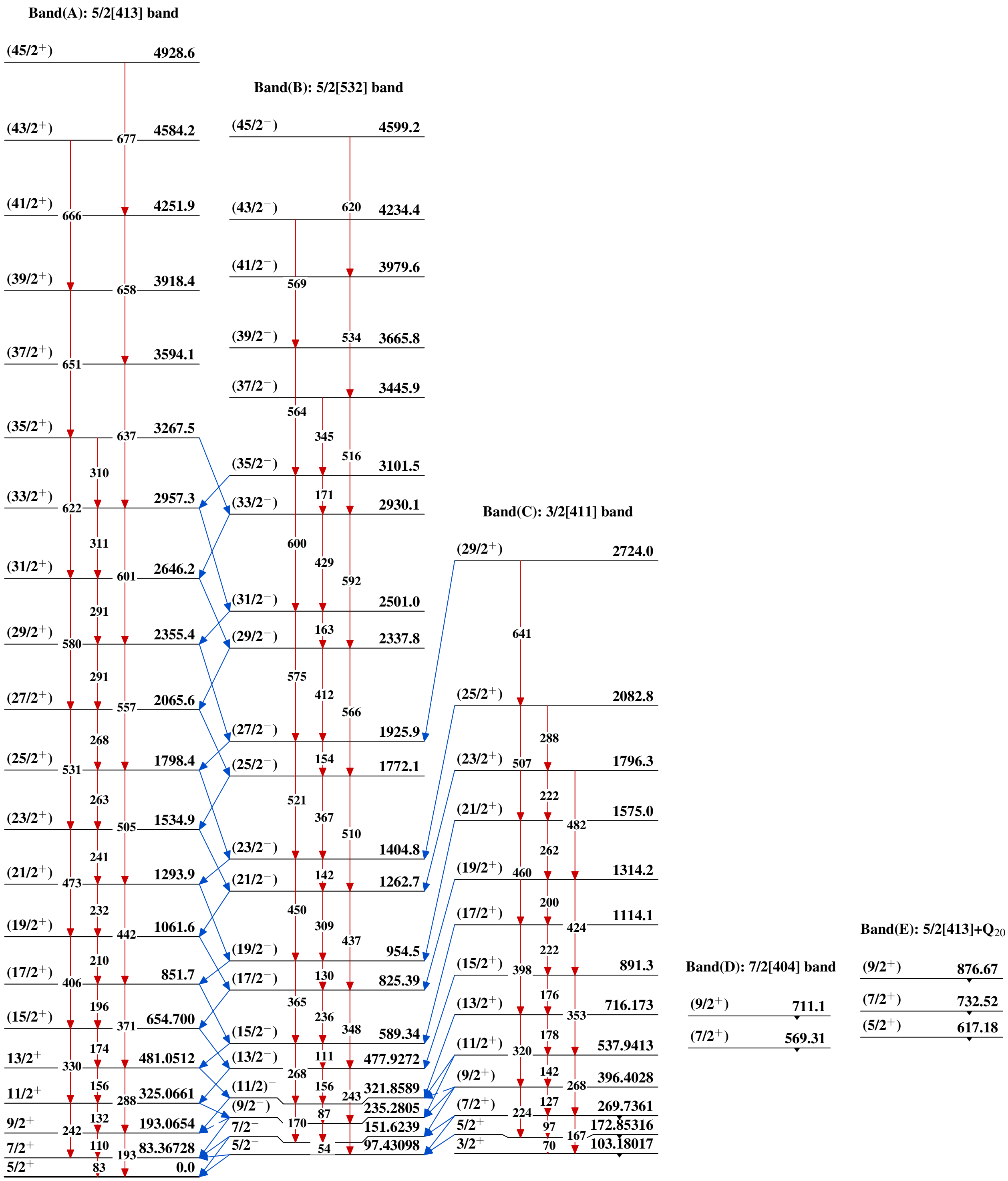
Level Scheme (continued)

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



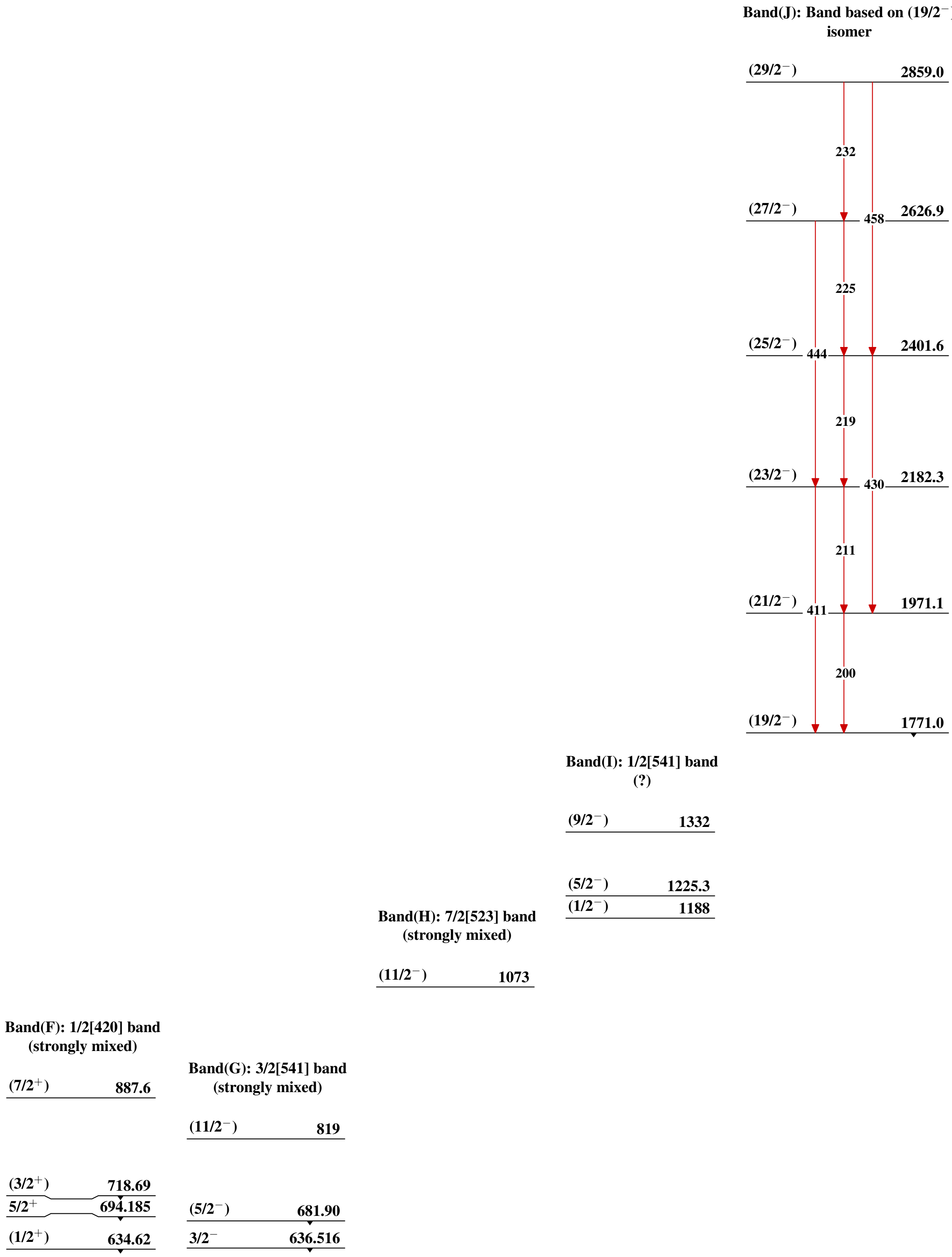
$^{153}_{63}Eu_{90}$

Adopted Levels, Gammas



$^{153}_{63}Eu_{90}$

Adopted Levels, Gammas (continued)



$^{153}_{63}Eu_{90}$