Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 132, 1 (2016)	4-Dec-2015

Q(β^-)=−60.0 *3*; S(n)=6359.88 *15*; S(p)=8030 *3*; Q(α)=−688.7 *4* 2017Wa10
S(2n)=14896.23 *15*; S(2p)=15210.6 *3* 2017Wa10
Additional information 1.
Model and theoretical discussions of interest:
Occupation numbers of the 11/2[505] neutron state (1984Pe03).
Mixing of the N=4 and 6 Nilsson states (1971Ga34).
Wave functions, level energies, B(E2), and cross sections (1970Ka47,1971Ma41,1973Ga29,1975Hi01,1996Pr02).
Energy spacings in 3/2⁻ band in terms of Coriolis mixing with 1/2⁻ band (1974Jo06); other level energies (1994Pr04,1996Pr02).
γ branching (1979Ka11).
Moments (1970Va02,1973Ba85,1973Bu22,1973RaXR,1974Ba18).
Cluster decay probabilities (2003Gu13).
Isotope shifts (2011Ji11).
Scissors-mode strength (2013Kr11,2013Kr07).

^{157}Gd Levels

Below 600 keV the band structure and band assignments in ^{157}Gd are well established. Above this energy, the experimental data and the theoretical considerations indicate that the band structure is complex and the assignments are not unambiguous. In fact, above 600 keV, most Nilsson orbitals have been assigned to different sets of levels in different studies. Also, many levels have not been given band assignments. Even for the existing band assignments, the deviations between the observed and theoretical (d,p) and (d,t) cross sections suggest more complex Nilsson orbital mixtures or additional unresolved levels. See 1970Ka47 for theoretical cross sections with and without Coriolis coupling.

Accordong to 2003Bo25 for J$^\pi$ assignments from (n,n′γ) and (n,γ) reactions definite values instead of tentative were adopted for levels populated by primary γ rays decaying the 1/2⁺, S(n)+x resonance based on the following rather empirical arguments:

(i) primary transitions are of dipole type (quadrupole type or higher are extremely rare);

(ii) primary E1 transitions in heavy nuclei can be distinguish from M1 transitions (E1′s being on average stronger by a factor of seven than M1′s).

Additional information 2.

Cross Reference (XREF) Flags

A	^{157}Eu β^- decay	G	^{156}Gd(n,γ) E=resonance	M	^{157}Gd(d,d′)
B	^{157}Gd IT decay (18.5 μs)	H	^{156}Gd(n,γ) E=2 keV	N	^{158}Gd(p,dγ)
C	^{157}Tb ε decay	I	^{156}Gd(n,γ) E=24 keV	O	^{158}Gd(d,t),(p,d),(^{3}He,α)
D	^{161}Dy α decay:?	J	^{156}Gd(d,p)	P	Coulomb excitation
E	^{155}Gd(t,p)	K	^{157}Gd(γ,γ′)		
F	^{156}Gd(n,γ) E=th	L	^{157}Gd(n,n′γ)		

E(level)[†‡]	J$^\pi$	$T_{1/2}$[#]	XREF	Comments
0.0[a]	3/2⁻	stable	ABCDEFGHIJKLMNOP	μ=−0.3398 *7*; Q=+1.36 *2* J$^\pi$: J from hyperfine structure (1956Sp21,1956Lo29,1961Ka23) as well as more recent laser spectroscopy. π from interpretation of (d,p) and (d,t) cross sections in terms of Nilsson states. δ<r^2>(156,157)=0.031 fm^2 *4* (1987GaZN). RMS charge radius <r^2>$^{1/2}$=5.1449 fm *42* (2013An02). μ: From 1989Ra17 evaluation and 2014StZZ compilation based on atomic beam magnetic resonance (direct moment measurement) and electron-nuclear double resonance methods and on data of 1969Ba15 and 1969Un02. Other

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Adopted Levels, Gammas (continued)

^{157}Gd Levels (continued)

E(level)[†‡]	J^{π}	$T_{1/2}$[#]	XREF	Comments
				value in this evaluation and compilation is −0.3373 *6* based on data of based data of 1978Va24. Q: From 1989Ra17 evaluation and 2014StZZ compilation based on muonic X-ray hyperfine structure and optical spectroscopy methods and on data of 1982Ta01. Other values in 1989Ra17 and 2014StZZ are +1.36 *6* (1990Ji06), +1.35 *3* (1983La08), +1.34 *7* (1979Cl04), and +1.38 *2* (1969Un02).
54.536[a] *6*	5/2−	130 ps *8*	ABCDEFG KLMNOP	Q=−0.46 *2* J^{π}: From comparison of observed and theoretical cross sections for charged-particle reactions and M1+E2 γ to 3/2− level. $T_{1/2}$: From Mossbauer study (1972Go40). Other: 0.21 ns 8 computed from BE2=2.21 from Coulomb excitation. Q: From 1989Ra17 evaluation and 2014StZZ compilation and based on muonic X-ray hyperfine structure method and on measurement of 1983La08.
63.916[b] *5*	5/2+	0.46 μs *4*	AB D FG IJKL NOP	μ=−0.464 *11*; Q=2.43 *7* J^{π}: From comparison of observed and theoretical cross sections for charged-particle reactions, averaged-resonance n capture data, and E1 γ's to 3/2− and 5/2− levels. $T_{1/2}$: From ^{157}Eu β- decay (1964Ka04). Other: 0.59 μs *12* from ^{157}Gd IT decay (18 μs) (1967Bo05). μ: From 1989Ra17 evaluation and 2014StZZ compilation and based on Mossbauer spectrometry and reanalysis by 1974Ar23 of data of 1972Go22. Q: From 2014StZZ compilation and based on Mossbauer spectrometry and reanalysis by 1974Ar23 of data of 1972Go22. 1989Ra17 evaluation: 2.45 *5*. Other: Mossbauer spectrometry measurement (1968Pr08).
115.717[b] *7*	7/2+		AB FG KL NOP	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01) and M1+E2 γ to 5/2+ level.
131.451[a] *9*	7/2−	100 ps *10*	AB DEFG JKLMNOP	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01) and M1+E2 γ to 5/2− level. $T_{1/2}$: weighted average of 95 ps *5* from microwave method (1972Da25) and 120 ps *10* (computed from B(E2)↑=1.20 *9* in Coulomb excitation dataset).
180.229[b] *11*	9/2+		AB DEFG J LMNOP	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01) and (M1+E2) γ to 7/2+ level.
226.983[a] *19*	9/2−	16.7 ps *15*	AB DEFG J LMNOP	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01).
272.22[b] *3*	11/2+		F J L N P	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01).
315? *3*			J	
347.05[a] *6*	11/2−	12.2 ps *10*	E J LMNOP	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01).
361.04[b] *9*	13/2+		J L NO	J^{π}: From L=6 in (^{3}He,α) and band assignment.
372? *3*			O	
426.539[c] *23*	11/2−	18.5 μs *23*	B L NO	%IT=100 J^{π}: From systematic occurrence of 11/2[505] orbital as isomer, γ's to 9/2− and 9/2+ levels, and L=5 in (^{3}He,α). $T_{1/2}$: Weighted average of 17 μs *1* (1967Bo05) and 22.0 μs *15* (1961Kr01) from IT decay of this level.
434.426[d] *6*	5/2−	<0.1 ns	A DEFG J LMNOP	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01) and E1 γ's to 5/2+ and 7/2+ levels. $T_{1/2}$: from ^{157}Eu β^- decay. Also, computed as 0.03 ps from B(E2)↑=0.0039 (Coulomb excitation dataset), but γ branching is not well established; other: < 0.1 ns from ^{157}Eu. β- decay (1966Me06).

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Adopted Levels, Gammas (continued)

^{157}Gd Levels (continued)

E(level)[†‡]	J^π	$T_{1/2}$[#]	XREF	Comments
474.630[e] 6	$3/2^+$	<0.1 ns	A D FGHIJ LMNOP	J^π: From $1/2^+$ or $3/2^+$ from averaged-resonance n-capture data, and M1 γ to $5/2^+$ level. $T_{1/2}$: From ^{157}Eu β- decay (1966Me06).
478.62[a] 4	$13/2^-$	7.3 ps 6	LMN P	J^π: From γ's to $9/2^-$ and $11/2^-$ levels and interpretation of (d,d′) data.
508.93 11	$15/2^+$		L OP	XREF: O(513).
514.671[d] 8	$7/2^-$		A DEFG J LMNOP	J^π: From interpretation of (d,d′) data.
524.847[e] 7	$5/2^+$		A FG I L N P	J^π: From averaged-resonance n-capture data.
566 1			F	
579.40[c] 8	$(13/2^-)$		L N	J^π: γ from $(11/2^-)$ and γ to $11/2^-$; $(13/2^-)$ initially tentatively assigned by 2003Bo25 (^{157}Gd(n,n′γ)) is also adopted by 2014Ro25 (^{158}Gd(p,dγ)).
607.589[e] 15	$7/2^{(+)}$		A FG L	J^π: From γ's to $5/2^-$, $5/2^+$, $9/2^+$, and $9/2^-$ levels; band assignment assumes J^π=$7/2^+$.
612.1 5	$17/2^+$		P	J^π: From γ's to $13/2^+$ and $15/2^+$ levels in Coulomb excitation.
617.38[d] 3	$9/2^-$		J L NO	J^π: From interpretation of (d,p) and (d,t) data (1967Tj01).
640.33[a] 8	$15/2^-$	4.3 ps 3	E LM P	J^π: From γ's to $11/2^-$ and $13/2^-$ levels and Coulomb excitation of g.s. band.
655.7 5			I	
664.44[e] 5	$9/2^+$		J L O	J^π: From γ's to $7/2^-$ and $11/2^+$ levels and band assignment.
682.82[f] 4	$1/2^+$		FG J L NO	J^π: From L=0 in (p,d).
683.236[l] 9	$3/2^+$	<0.3 ns	A FGHI L N	J^π: $1/2^+$ or $3/2^+$ from averaged-resonance n-capture data and γ to $7/2^+$ level. $T_{1/2}$: From ^{157}Eu β- decay (1966Me06).
686.667 9	$5/2^+,7/2^+$		A FG L	J^π: From γ's to $3/2^+$ and $9/2^+$ levels; band assignments assumes $5/2^+$.
701.39[g] 4	$(1/2)^-$		DEFGHIJ LMNOP	J^π: From L=1 in (p,d) and $1/2^-$ or $3/2^-$ from averaged-resonance n-capture data, and band assignment.
722.9? 2			A M OP	
729.23 3	$3/2^-$		A FGHI L N	J^π: From averaged-resonance n-capture data and γ to $3/2^-$ level. 2014Ro25 assign both $1/2^-$,$3/2^-$ based on L=1.
741.72[l] 5	$9/2^+$		F L	J^π: From γ's to $7/2^-$ and $9/2^+$ levels and band assignment.
746.9[g] 5	$(3/2^-)$		J M OP	J^π: From interpretation of (d,p) and (d,t) reaction data (1967Tj01).
751.436[f] 12	$3/2^+$		A FGHI L NO	J^π: $1/2^+$ or $3/2^+$ from averaged-resonance n-capture data and γ's to $5/2^-$ and $7/2^+$ levels.
762.670[i] 17	$3/2^-$		A eFGHI L o	XREF: e(766)o(770). J^π: $1/2^-$ or $3/2^-$ from averaged-resonance n-capture data and γ to $5/2^+$ level.
771.302[l] 17	$(7/2^+)$		A eFG L o	XREF: e(766)o(770). J^π: From γ's to $5/2^-$, $5/2^+$, $9/2^+$, and possibly $9/2^+$ levels band assignment.
788.54 3	$5/2^-$		eFG LM	XREF: e(792). J^π: From interpretation of (d,d′) data.
793.67[h] 4	$1/2^-$		FGHI L NO	J^π: $1/2^-$ or $3/2^-$ from averaged-resonance n-capture data; band assignment assumes J^π=$1/2^-$.
794 3	$(5/2^-)$		e J	XREF: e(792). J^π: From interpretation of (d,p) and (d,t) data (1967Tj01). J^π: Assigned as the $5/2^-$ members of both the 1/2[521] and 3/2[532] bands.
801.32[a] 9	$17/2^-$	2.6 ps 2	L P	J^π: From γ's to $13/2^-$ and $15/2^-$ levels and Coulomb excitation of g.s. band.
806.67[l] 12	$11/2^+$		L	J^π: From γ to $11/2^+$ level and band assignment.
809.13[h] 3	$3/2^-$		EFGHIJ LMNO	XREF: E(816).

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Adopted Levels, Gammas (continued)

^{157}Gd Levels (continued)

E(level)[†‡]	J^{π}	$T_{1/2}$[#]	XREF	Comments
				J^{π}: 1/2$^-$ or 3/2$^-$ from averaged-resonance n-capture data, band assignment assumes J^{π}=3/2$^-$.
814.11 *4*	(5/2$^-$)		A FG L OP	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01).
816.50 *5*	(5/2$^+$)		F I L	J^{π}: From averaged-resonance n-capture data.
816.574 *15*	(5/2,7/2$^-$)		A	J^{π}: From γ's to 3/2$^-$, 7/2$^-$, and 7/2$^+$ levels.
827 *1*			F	
831.9 *5*	19/2$^+$		P	J^{π}: From γ's to 15/2$^+$ and 17/2$^+$ levels in Coulomb excitation.
840 *4*	(5/2$^-$)		E J M O	XREF: E(845)J(834)M(842)O(837). J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01).
840.42[g] *8*	7/2$^-$		F L	J^{π}: From γ's to 3/2$^-$ and 9/2$^-$ levels and band assignments.
849.3 *2*	11/2$^+$,13/2$^+$[@]		NO	
875 *2*			F	
887.93[h] *6*	5/2$^-$		LM	J^{π}: From γ's to 3/2$^-$ and 5/2$^-$ levels and band assignment.
902 *3*	(7/2$^-$)		E J O	J^{π}: From interpretation of (d,p) and (d,t) data (1967Tj01). J^{π}: Assigned as the 7/2$^-$ members of both the 1/2[521] and 1/2[530] bands.
916			M O	
919.31 *4*	(7/2$^+$,9/2$^-$)		A EF L N	J^{π}: From γ's to 7/2$^+$, 9/2$^+$ and possibly 5/2$^-$ levels.
937.2 *6*	1/2$^+$,3/2$^+$		G	J^{π}: From primary γ in (n,γ) resonance.
939.3 *7*	21/2$^+$		P	J^{π}: From γ's to 17/2$^+$ and 19/2$^+$ levels in Coulomb excitation.
952 *1*			F	
964[h] *3*	(9/2$^-$)		E J M O	XREF: E(967)J(965)M(961)O(962). J^{π}: From interpretation of charged-particle reaction data.
972. *2*			FG I	
981[g] *5*	(9/2$^-$)		j O	XREF: j(988). J^{π}: From interpretation of charged-particle reaction data.
996.6 *9*			Ij	XREF: j(988).
1002.53[a] *12*	19/2$^-$	1.81 ps *16*	P	J^{π}: From γ's to 15/2$^-$ and 17/2$^-$ levels and Coulomb excitation of g.s. band.
1015 *2*			M	
1041.50 *20*	1/2,3/2$^-$		FGHIJ L	J^{π}: From averaged-resonance n-capture data.
1044 *7*	3/2$^-$		E	J^{π}: From L=0 in (t,p).
1049.68 *4*			A FG L	
1059.67 *7*	3/2,5/2		F L	J^{π}: From γ's to 3/2$^-$, 3/2$^+$,5/2$^-$, and 5/2$^+$ levels.
≈1060[h]	(11/2$^-$)		O	J^{π}: From interpretation of charged-particle reaction data.
1060.07 *6*	3/2$^+$,5/2		A	J^{π}: From γ's to 3/2$^-$, 3/2$^+$, and 7/2$^+$ levels.
1062.5 *6*			F I	
1093.04 *6*	1/2$^+$,3/2$^+$		FGHI M O	J^{π}: From averaged-resonance n-capture data.
1108.3 *11*			E G J M O	
1136.7 *3*			I M	
1142.0 *8*	5/2$^+$		IJ O	J^{π}: From averaged-resonance n-capture data.
1157.0 *9*	5/2$^+$		FG I	J^{π}: From averaged-resonance n-capture data.
1166.8 *11*			G	
1184.5 *5*			E IJ O	XREF: E(1178)O(1175).
1185.62[a] *13*	21/2$^-$	1.15 ps *17*	P	J^{π}: From γ's to 17/2$^-$ and 19/2$^-$ levels and Coulomb excitation of g.s. band.
1204 *5*			E J O	
1231.50 *10*	5/2$^+$,7/2,9/2$^+$		A F LM	XREF: M(1227). J^{π}: From γ's to 5/2$^+$ and 9/2$^+$ levels.
1238.1 *11*	1/2$^+$,3/2$^+$		G	J^{π}: From averaged-resonance n-capture data.
1241.1 *9*	23/2$^+$		P	J^{π}: From γ to 19/2$^+$ level in Coulomb excitation.
1247.20 *7*	1/2$^+$,3/2$^+$		FG I L O	J^{π}: From averaged-resonance n-capture data.
1249.6 *4*	1/2$^+$,3/2$^+$		HI	J^{π}: From averaged-resonance n-capture data.

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Adopted Levels, Gammas (continued)

^{157}Gd Levels (continued)

E(level)[†‡]	J^π	$T_{1/2}$[#]	XREF	Comments
1282.7 9	$1/2^+,3/2^+$		EF HIj M	XREF: j(1289). J^π: From averaged-resonance n-capture data.
1285.8 11	1/2,3/2		G j	XREF: j(1289). J^π: From averaged-resonance n-capture data.
1298.25 17	$1/2^+,3/2^+$		GHIj	XREF: j(1289). J^π: From averaged-resonance n-capture data.
1305 5			O	
1316.39 6	$1/2^-,3/2^-$		EFGHIJ M O	J^π: From averaged-resonance n-capture data.
1332.7 20	$1/2^+,3/2^+$		GHIJ M	J^π: From averaged-resonance n-capture data.
1339.10 24	$1/2^+,3/2^+$		HI O	J^π: From averaged-resonance n-capture data.
1344.8 13	$25/2^+$		P	J^π: From γ to $21/2^+$ level in Coulomb excitation.
1349.13 6	$1/2^-$		FGHIJ M O	XREF: J(1354)O(1352). J^π: From averaged-resonance n-capture data.
1377.4 22			e I m	XREF: e(1383)m(1381).
1387.06 5	$1/2^-,3/2^-$		eFGHI m	XREF: e(1383)m(1381). J^π: From averaged-resonance n-capture data.
1393[j] 5	$(7/2^-)$		e J O	XREF: e(1406)J(1391)O(1396). J^π: From interpretation of charged-particle reaction data.
1399.3 5			e I M	XREF: e(1406)M(1403).
1412.71 17	$1/2^-,3/2^-$		GHI O	J^π: From averaged-resonance n-capture data.
1423.9[a] 8	$23/2^-$	0.60 ps 5	P	J^π: From γ to $19/2^-$ level and Coulomb excitation of g.s. band.
1437.2 6			IJ M	XREF: M(1433).
1446.5 9	$5/2^+$		I	J^π: From averaged-resonance n-capture data.
1455 2			M	
1467.4 13	5/2		e Ij O	XREF: e(1474)j(1472). J^π: From averaged-resonance n-capture data.
1477.90 23			e GHIj m	XREF: e(1474)j(1472)m(1482). J^π: Assign $(5/2)^+$ from 1986GrZR and $(1/2,3/2)^-$ from 1993Ko01, both in ^{156}Gd(n,γ).
1486.8 5	1/2,3/2		F j m	XREF: j(1487)m(1482). J^π: From averaged-resonance n-capture data.
1490.07 5	$3/2^+$		FGHIj	XREF: j(1487). J^π: $1/2^+,3/2^+$ from averaged-resonance n-capture data; $1/2^+$ less likely from γ to $5/2^-$.
1510 2			M	
1521.36 17	$3/2^-$		EFGHIJ o	XREF: o(1524). J^π: From L=0 in (t,p) and averaged-resonance n-capture data.
1526.12 6	1/2,3/2		FGHI o	XREF: o(1524). J^π: From averaged-resonance n-capture data.
1536.6 15	$1/2^+,3/2^+$		G	J^π: From averaged-resonance n-capture data.
1540.0 5	$1/2^+,3/2^+$		F	J^π: From averaged-resonance n-capture data.
1552.0 5	$1/2^+,3/2^+$		HIj o	XREF: j(1555)o(1556). J^π: From averaged-resonance n-capture data.
1552.2[&] 2	$5/2^+$[@]		N	
1556.3 5			Ij o	XREF: j(1555)o(1556).
1562.7 5	$1/2^+,3/2^+$		HI o	XREF: o(1556). J^π: From averaged-resonance n-capture data.
1563.1 6	$(3/2^-,5/2,7/2^-)$		N	J^π: γ's to $3/2^-$ and $7/2^-$.
1564.7 17	$1/2,3/2^+$		HI o	XREF: o(1569). J^π: From averaged-resonance n-capture data.
1568.48 20			FGHI o	XREF: o(1569).
1574.1 4			e I o	XREF: e(1578)o(1569).
1583.7 4	$(1/2^+,3/2^+)$		e HI o	XREF: e(1578)o(1589). J^π: From averaged-resonance n-capture data.
1589.68 12	1/2,3/2		eFGHIJ o	XREF: e(1599)J(1593)o(1589).

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Adopted Levels, Gammas (continued)

^{157}Gd Levels (continued)

E(level)[†‡]	J^{π}	XREF	Comments
			J^{π}: From averaged-resonance n-capture data.
1589.8[&] *2*	$3/2^+,5/2^+$[@]	N	Possibly same level as 1589.7.
1606.8 *6*		e I o	XREF: e(1599)o(1611).
1611.88 *18*	$1/2^-,3/2^-$	HIj o	XREF: j(1614)o(1611). J^{π}: From averaged-resonance n-capture data.
1614.13 *8*	$(3/2^-)$	FG j o	XREF: j(1614)o(1611). J^{π}: $1/2^-,3/2^-$ from averaged-resonance n-capture data; $(3/2^-)$ from γ to $7/2^+$.
1616.68 *20*	$1/2^-,3/2^-$	HIj o	XREF: j(1614)o(1611). J^{π}: From averaged-resonance n-capture data.
1623.1[a] *9*	$25/2^-$	P	J^{π}: From γ to $21/2^-$ level and Coulomb excitation of g.s. band.
1635.8 *4*	$(1/2,3/2)^+$	GHI O	J^{π}: From averaged-resonance n-capture data.
1649.0 *6*		I	
1658.76 *10*	$1/2^-,3/2^-$	FGHIJ	J^{π}: From averaged-resonance n-capture data.
1667.58 *11*	$(1/2,3/2)^-$	FGHI O	XREF: O(1670). J^{π}: From averaged-resonance n-capture data.
1678.9 *7*	$(1/2,3/2)^+$	HI	J^{π}: From averaged-resonance n-capture data.
1692.2 *4*		GHI	
1701.7 *5*		HI	
1707.0 *15*	$(1/2,3/2)^+$	G	J^{π}: From averaged-resonance n-capture data.
1717.66 *15*	$(1/2,3/2)^-$	FGHI o	XREF: o(1720). J^{π}: From averaged-resonance n-capture data.
1720.70 *16*	(1/2,3/2)	HI o	XREF: o(1720). J^{π}: From averaged-resonance n-capture data.
1732.5 *14*	$27/2^+$	P	J^{π}: From γ to $23/2^+$ in Coulomb excitation.
1735.6[&] *2*	$5/2^+$[@]	N	
1736.4 *3*	$1/2^-,3/2^-$	HI O	XREF: O(1731). J^{π}: From averaged-resonance n-capture data.
1739.7 *9*	$1/2^-,3/2^-$	FGHIj O	XREF: j(1744). J^{π}: From averaged-resonance n-capture data.
1750.14 *15*	$1/2^-,3/2^-$	FGHIj	XREF: j(1744). J^{π}: From averaged-resonance n-capture data.
1760.09 *23*	$1/2^+,3/2^+$	HIj	XREF: j(1767). J^{π}: From averaged-resonance n-capture data.
1766.6 *15*	$1/2^+,3/2^+$	H j	XREF: j(1767). J^{π}: From averaged-resonance n-capture data.
1788.2 *5*	$1/2^+,3/2^+$	HIj	XREF: j(1793). J^{π}: From averaged-resonance n-capture data.
1798.6 *7*	$(3/2^-)$	EFG Ij	XREF: j(1793). J^{π}: From L=(0) in (t,p), if it is associated with this level and averaged-resonance n capture.
1802.0 *3*		HIj	XREF: j(1809).
1810		j O	XREF: j(1809).
1824.10 *9*	$1/2^-,3/2^-$	FGHI	J^{π}: From averaged-resonance n-capture data.
1825[k] *5*	$7/2^+$	O	J^{π}: From interpretation of charged-particle reaction data.
1825.6[&] *1*	$5/2^+$[@]	N	
1827.3 *16*	$29/2^+$	P	J^{π}: From γ to $25/2^+$ in Coulomb excitation.
1836.2 *3*	$1/2^-,3/2^-$	e HIJ o	XREF: e(1840)J(1833)o(1840). J^{π}: From averaged-resonance n-capture data.
1844.91 *6*		eFGHIj o	XREF: e(1840)j(1845)o(1840). J^{π}: $1/2^-,3/2^-$ from averaged-resonance n-capture data; inconsistent with γ's to $9/2^+$.
1850.7 *4*	$1/2^+,3/2^+$	HIj	XREF: j(1845). J^{π}: From averaged-resonance n-capture data.
1856.6 *10*	$1/2^+,3/2^+$	FGHI	J^{π}: From averaged-resonance n-capture data.
1861.72 *18*	$1/2^-,3/2^-$	HI	J^{π}: From averaged-resonance n-capture data.

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Adopted Levels, Gammas (continued)

^{157}Gd Levels (continued)

E(level)[†‡]	J^π	XREF	Comments
1864.1 *15*	1/2,3/2	G j	XREF: j(1869). J^π: From averaged-resonance n-capture data.
1867.94 *16*		F Ij	XREF: j(1869).
1889.26 *18*	$1/2^-,3/2^-$	F HI	J^π: From averaged-resonance n-capture data.
1896.36 *25*	$1/2^+,3/2^+$	E HI	XREF: E(1899). J^π: From averaged-resonance n-capture data.
1896.4 *13*	$27/2^-$	P	J^π: From γ to $23/2^-$ level in Coulomb excitation.
1902 *15*	$11/2^-$	O	J^π: From interpretation of charged-particle reaction data.
1905.9 *4*	$(11/2^-)$[@]	N	Configuration=ν9/2[514] (2014Ro25).
1906.1 *4*		H J	Possiblysame level as 1905.9.
1915.88 *14*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.
1920.91 *25*	1/2,3/2	F HI	J^π: From averaged-resonance n-capture data.
1927.47 *8*	$3/2^+,5/2,7/2^-$	F j	XREF: j(1929). J^π: From γ's to $3/2^-$ and $7/2^+$ levels.
1937.18 *20*	$1/2^-,3/2^-$	F HIj	XREF: j(1929). J^π: From averaged-resonance n-capture data.
1953.0 *5*	$1/2^+,3/2^+$	eF HI o	XREF: e(1958)o(1960). J^π: From averaged-resonance n-capture data.
1956.0 *10*	$1/2^-,3/2^-$	eF HI K o	XREF: e(1958)o(1960). J^π: From averaged-resonance n-capture data.
1959.3 *9*		e I o	XREF: e(1958)o(1960).
1963.3 *8*		H o	XREF: o(1960).
1973.7 *4*	1/2,3/2	F	J^π: From averaged-resonance n-capture data.
1976.0 *10*	1/2,3/2	HI K	J^π: From averaged-resonance n-capture data.
1984.0 *5*	$1/2^-,3/2^-$	F HI	J^π: From averaged-resonance n-capture data.
1992.01 *23*	$1/2^-,3/2^-$	F HI	J^π: From averaged-resonance n-capture data.
1997.3 *5*	$1/2^+,3/2^+$	EF HI	XREF: E(2004). J^π: From averaged-resonance n-capture data.
2015.8 *7*		H	
2028.6? *6*		I	
2038.04 *25*	$1/2^-,3/2^-$	F HI	J^π: From averaged-resonance n-capture data.
2044.4 *5*		F H	
2052.2 *3*		F HI	
2073.0 *10*	(1/2,3/2)	HI K	J^π: From averaged-resonance n-capture data.
2094.2 *3*	$1/2^+,3/2^+$	HI	J^π: From averaged-resonance n-capture data.
2099.3 *3*		HI	
2108.7 *13*	$29/2^+$	P	
2118.1 *4*	$1/2^-,3/2^-$	e HI	XREF: e(2119). J^π: From averaged-resonance n-capture data and L=(0) in (t,p).
2123.3 *7*		e HI	XREF: e(2119).
2131.0 *10*		HI K	
2135.9 *4*		HI	
2146.7 *3*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.
2164.81 *16*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.
2173.6 *3*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.
2180.0 *10*		HI K	
2181.2 *3*		HI	
2188.56 *20*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.
2200.0 *10*	$1/2^-,3/2^-$	HI K	J^π: From averaged-resonance n-capture data.
2207.75 *21*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.
2218.1 *3*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.
2230.3 *3*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.
2242.2 *6*		HI	
2250.0 *10*		HI K	
2253.0 *10*		K	
2259.48 *25*	$1/2^-,3/2^-$	HI	J^π: From averaged-resonance n-capture data.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{157}Gd Levels (continued)

E(level)[†‡]	Jπ	XREF	Comments
2276.2 *8*		HI	
2290.0 *10*	$1/2^-,3/2^-$	HI K	Jπ: From averaged-resonance n-capture data.
2303.4 *7*		HI	
2306.0 *10*		HI K	
2317.1 *3*	$1/2^-,3/2^-$	HI	Jπ: From averaged-resonance n-capture data.
2328.1 *4*		HI	
2335.0 *10*	$1/2^-,3/2^-$	HI K	Jπ: From averaged-resonance n-capture data.
2342.8 *4*		HI	
2346.0 *10*		K	
2352.6 *4*		HI	
2367.3 *3*	$1/2^-,3/2^-$	HI	Jπ: From averaged-resonance n-capture data.
2373.39 *19*	$1/2^-,3/2^-$	HI	Jπ: From averaged-resonance n-capture data.
2380.8 *4*	$1/2^-,3/2^-$	HI o	XREF: o(2390). Jπ: From averaged-resonance n-capture data.
2387.1 *5*		HI o	XREF: o(2390).
2393.4 *7*		HI o	XREF: o(2390).
2397.0 *10*		K	
2402.0 *10*		HI K o	XREF: o(2390).
2413.3 *5*	$1/2^+,3/2^+$	HI	Jπ: From averaged-resonance n-capture data.
2441.6 *4*	$1/2^-,3/2^-$	HI	Jπ: From averaged-resonance n-capture data.
2446.0 *10*		K	
2465.7 *7*		HI	
2469.3 *6*	$1/2^-,3/2^-$	HI	Jπ: From averaged-resonance n-capture data.
2488.0 *10*		K	
2491.9 *3*	$1/2^+,3/2^+$	HI	Jπ: From averaged-resonance n-capture data.
2504.0 *10*		K	
2509.0 *10*		K	
2519.0 *10*		HI K	
2523.9 *5*		HI	
2527.0 *10*		K	
2537.0 *10*		K	
2542.0 *10*		HI K	
2547.0 *10*		K	
2556.0 *10*		HI K	
2564.0 *10*		HI K	
2571.3 *4*		HI	
2581.0 *10*		K	
2585.2 *3*	$1/2^-,3/2^-$	HI	Jπ: From averaged-resonance n-capture data.
2592.0 *10*	$1/2^-,3/2^-$	HI K	Jπ: From averaged-resonance n-capture data.
2594.0 *10*		HI K	
2607.8 *3*	$1/2^-,3/2^-$	HI	Jπ: From averaged-resonance n-capture data.
2614.7 *4*	$1/2^-,3/2^-$	HI	Jπ: From averaged-resonance n-capture data.
2626.0 *5*		HI	
2633.0 *10*	$1/2^-,3/2^-$	HI K	Jπ: From averaged-resonance n-capture data.
2650.6 *6*		HI	
2657.0 *10*		K	
2659.2 *5*	$1/2^+,3/2^+$	HI	Jπ: From averaged-resonance n-capture data.
2663.2 *11*		HI	
2666.3 *5*	$(1/2,3/2)^+$	HI	Jπ: From averaged-resonance n-capture data.
2674.3 *7*		K	
2689.0 *10*		K	
2694.0 *10*		K	
2706.2 *7*		K	
2721.0 *10*		K	
2744.0 *10*		K	
2760.0 *10*		K	

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Adopted Levels, Gammas (continued)

^{157}Gd Levels (continued)

E(level)[†‡]	XREF	E(level)[†‡]	XREF	E(level)[†‡]	XREF
2778.4 *7*	K	3084.3 *7*	K	3375.0 *10*	K
2787.0 *10*	K	3088.0 *10*	K	3413.0 *10*	K
2798.0 *10*	K	3100.0 *10*	K	3456.0 *10*	K
2827.0 *7*	K	3106.0 *10*	K	3472.0 *10*	K
2841.0 *10*	K	3131.0 *10*	K	3479.0 *10*	K
2846.0 *10*	K	3154.0 *10*	K	3506.0 *10*	K
2858.0 *10*	K	3158.0 *7*	K	3528.0 *10*	K
2863.0 *10*	K	3162.0 *10*	K	3663.0 *10*	K
2883.0 *10*	K	3228.0 *10*	K	3680.0 *10*	K
2906.0 *10*	K	3233.0 *10*	K	3684.0 *10*	K
2916.3 *7*	K	3239.0 *10*	K	3713.0 *10*	K
2925.3 *7*	K	3251.0 *10*	K	3717.0 *10*	K
3020.3 *7*	K	3268.0 *10*	K	3734.0 *10*	K
3035.0 *10*	K	3272.0 *10*	K	3739.0 *10*	K
3040.0 *10*	K	3288.0 *10*	K	3775.0 *10*	K
3049.4 *7*	K	3333.0 *10*	K	3821.3 *7*	K
3057.0 *10*	K	3346.0 *10*	K	3842.1 *10*	K
3078.3 *7*	K	3356.0 *10*	K		

[†] Values computed from least-squares fit to γ energies where there are populating or depopulating γ rays. Where there are no γ's, values from reactions have been averaged. Reduced χ^2=2.5 (critical χ^2=1.3).
[‡] Above 800 many of the associations of levels from different reactions are not unique.
[#] From direct measurements in Coulomb excitation (1992Ku15), unless otherwise noted. Above 1800 keV additional, approximate values can be computed from ^{157}Gd(γ,γ') data.
[@] from angular distribution of the deuterons in coincidence with G rays in ^{158}Gd(p,dγ) (2014Ro25).
[&] Any of the 1552, 1589, 1735 or 1825 levels is a possible candidate for ν5/2[402] configuration (2014Ro25, ^{158}Gd(p,dγ).
[a] Band(A): 3/2[521] band; A=10.82, B=0.0068.
[b] Band(B): 5/2[642] band; A=7.76, B=−0.0145.
[c] Band(C): 11/2[505] bandhead.
[d] Band(D): 5/2[523] band; A=11.46.
[e] Band(E): 3/2[402] band; A=10.04.
[f] Band(F): 1/2[400] bandhead.
[g] Band(G): 1/2[521] band.
[h] Band(H): 1/2[530] band; A=5.6, a=−0.10.
[i] Band(I): 3/2[532] bandhead.
[j] Band(J): 5/2[512] expected bandhead (only first ($7/2^-$) level known).
[k] Band(K): 7/2[404] bandhead.
[l] Band(L): 3/2[651] band.

Adopted Levels, Gammas (continued)

γ(^{157}Gd)

E_i(level)	J_i^π	E_γ[†‡]	I_γ	E_f	J_f^π	Mult.[#]	δ[#a]	α[&]	Comments
54.536	5/2⁻	54.548 *8*	100	0.0	3/2⁻	M1+E2	0.19 *4*	12.1 *3*	α(K)=9.50 *17*; α(L)=2.0 *3*; α(M)=0.45 *7* α(N)=0.102 *14*; α(O)=0.0150 *18*; α(P)=0.000718 *13* B(M1)(W.u.)=0.077 *6*; B(E2)(W.u.)=4.8×10^{2} *20*
63.916	5/2⁺	9.365 *12*	7.1 *11*	54.536	5/2⁻	E1		30.8	B(E1)(W.u.)=1.04×10^{-5} *21*
		63.929 *8*	100 *10*	0.0	3/2⁻	E1		0.961	B(E1)(W.u.)=4.6×10^{-7} *8* α(K)=0.795 *12*; α(L)=0.1301 *19*; α(M)=0.0283 *4* α(N)=0.00634 *9*; α(O)=0.000904 *13*; α(P)=4.18×10^{-5} *6*
115.717	7/2⁺	51.834 *14*	100	63.916	5/2⁺	M1+E2	0.20	14.06	α(K)=10.86 *16*; α(L)=2.50 *4*; α(M)=0.560 *8* α(N)=0.1272 *18*; α(O)=0.0184 *3*; α(P)=0.000831 *12*
131.451	7/2⁻	67.3	0.9 *8*	63.916	5/2⁺	E1		0.840	α(K)=0.697 *10*; α(L)=0.1126 *16*; α(M)=0.0244 *4* α(N)=0.00549 *8*; α(O)=0.000786 *11*; α(P)=3.68×10^{-5} *6* B(E1)(W.u.)=1.2×10^{-5} *11*
		76.925 *14*	100 *3*	54.536	5/2⁻	M1+E2	0.18	4.36	α(K)=3.57 *5*; α(L)=0.619 *9*; α(M)=0.1366 *20* α(N)=0.0312 *5*; α(O)=0.00469 *7*; α(P)=0.000265 *4* B(M1)(W.u.)=0.079 *9*; B(E2)(W.u.)=220 *25*
		131.438 *16*	30 *3*	0.0	3/2⁻	E2		0.940	α(K)=0.543 *8*; α(L)=0.307 *5*; α(M)=0.0719 *10* α(N)=0.01609 *23*; α(O)=0.00214 *3*; α(P)=2.82×10^{-5} *4* B(E2)(W.u.)=144 *21* I_γ: From Coulomb excitation. Others: 28 *7* from ^{157}Eu β- decay, 8 *4* from IT decay, and 44 *6* from (n,γ) resonance.
180.229	9/2⁺	64.4 *2*	100 *50*	115.717	7/2⁺	(M1+E2)		10.4 *32*	α(K)=4.5 *16*; α(L)=4.5 *37*; α(M)=1.07 *88* α(N)=0.24 *20*; α(O)=0.031 *25*; α(P)=3.0×10^{-4} *15*
		116.314 *28*	30 *8*	63.916	5/2⁺				
226.983	9/2⁻	95.7 *2*	100 *4*	131.451	7/2⁻				
		112.8	5.7 *20*	115.717	7/2⁺	E1		0.211	α(K)=0.1775 *25*; α(L)=0.0264 *4*; α(M)=0.00572 *8* α(N)=0.001294 *19*; α(O)=0.000190 *3*; α(P)=1.009×10^{-5} *15* B(E1)(W.u.)=0.00027 *10*
		172.37[@] *2*	72 *13*	54.536	5/2⁻	[E2]		0.367	α(K)=0.242 *4*; α(L)=0.0962 *14*; α(M)=0.0223 *4* α(N)=0.00501 *7*; α(O)=0.000680 *10*; α(P)=1.345×10^{-5} *19* B(E2)(W.u.)=1.6×10^{3} *4* E_γ: Poor energy fit; level energy difference is 172.78. I_γ: From Coulomb excitation; other: 73 *13* from IT decay and 150 *8* from (n,n′γ). Coulomb excitation: 92 4. B(E2)(W.u.)=1.6×10^{3} *4*, greater than upper limit 1000 presumably because contamination with close lying γ ray.
272.22	11/2⁺	91.96 *8*	100 *5*	180.229	9/2⁺				
		156.50 *4*	58 *3*	115.717	7/2⁺				
347.05	11/2⁻	120.1 *1*	75.9 *18*	226.983	9/2⁻				I_γ: From Coulomb excitation; other: 62 *3* from (n,n′γ).
		166.8	9 *3*	180.229	9/2⁺	E1		0.0736	α(K)=0.0622 *9*; α(L)=0.00893 *13*; α(M)=0.00193 *3* α(N)=0.000439 *7*; α(O)=6.56×10^{-5} *10*; α(P)=3.73×10^{-6} *6* B(E1)(W.u.)=0.00018 *7*
		215.6 *1*	100.0 *18*	131.451	7/2⁻	[E2]		0.1731	α(K)=0.1232 *18*; α(L)=0.0387 *6*; α(M)=0.00889 *13*

γ(^{157}Gd) (continued)

E_i(level)	J^π_i	E_γ[†‡]	I_γ	E_f	J^π_f	Mult.[#]	δ[#a]	α[&]	Comments
									α(N)=0.00200 *3*; α(O)=0.000276 *4*; α(P)=7.20×10^{-6} *11* B(E2)(W.u.)=9.8×10^{2} *9*
361.04	13/2$^+$	88.8		272.22	11/2$^+$				
		180.84 *10*	100	180.229	9/2$^+$				
426.539	11/2$^-$	199	49 *2*	226.983	9/2$^-$	[M1,E2]		0.26 *4*	α(K)=0.20 *5*; α(L)=0.044 *10*; α(M)=0.0100 *24* B(M1)(W.u.)<5.4×10^{-8}; B(E2)(W.u.)<0.0007 α(N)=0.0023 *5*; α(O)=0.00033 *6*; α(P)=1.36×10^{-5} *47*
		246.31 *2*	100 *5*	180.229	9/2$^+$	[E1]		0.0263	α(K)=0.0223 *4*; α(L)=0.00313 *5*; α(M)=0.000676 *10* α(N)=0.0001541 *22*; α(O)=2.33×10^{-5} *4*; α(P)=1.397×10^{-6} *20* B(E1)(W.u.)=5.1×10^{-10} *8*
434.426	5/2$^-$	302.994 *28*	0.61 *9*	131.451	7/2$^-$	[M1,E2]		0.076 *18*	α(K)=0.062 *17*; α(L)=0.0109 *3*; α(M)=0.00241 *4* α(N)=0.000551 *10*; α(O)=8.2×10^{-5} *5*; α(P)=4.3×10^{-6} *16*
		318.710 *8*	26.3 *13*	115.717	7/2$^+$	E1		0.01370	α(K)=0.01165 *17*; α(L)=0.001608 *23*; α(M)=0.000347 *5* α(N)=7.93×10^{-5} *12*; α(O)=1.207×10^{-5} *17*; α(P)=7.45×10^{-7} *11* B(E1)(W.u.)>1.4×10^{-5} I_γ: From ^{157}Eu β- decay (1986GrZS); other: 188 *25* from Coulomb excitation, 44.8 *17* from (n,γ) resonance, 31.4 *17* from (n,n′γ) and 43 *3* from (n,γ) E=th.
		370.509 *8*	100 *5*	63.916	5/2$^+$	E1		0.00947	α(K)=0.00807 *12*; α(L)=0.001105 *16*; α(M)=0.000238 *4* α(N)=5.45×10^{-5} *8*; α(O)=8.32×10^{-6} *12*; α(P)=5.22×10^{-7} *8* B(E1)(W.u.)>3.4×10^{-5}
		379.905 *9*	2.39 *24*	54.536	5/2$^-$	[M1,E2]		0.041 *11*	α(N)=0.00028 *3*; α(O)=4.2×10^{-5} *6*; α(P)=2.37×10^{-6} *84* α(K)=0.034 *10*; α(L)=0.0055 *7*; α(M)=0.00121 *12* I_γ: From ^{157}Eu β- decay (1986GrZS); other: 15.6 *12* Coulomb excitation and 7.7 *12* from (n,n′γ).
		434.388 *13*	3.2 *3*	0.0	3/2$^-$	[M1,E2]		0.0283 *80*	α(K)=0.0236 *73*; α(L)=0.0037 *6*; α(M)=0.00082 *12* α(N)=0.00019 *3*; α(O)=2.8×10^{-5} *5*; α(P)=1.67×10^{-6} *59* I_γ: From ^{157}Eu β- decay (1986GrZS); other: 9.4 *12* Coulomb excitation, and 3.20 *20* from (n,n′γ) .
474.630	3/2$^+$	358.931 *15*	1.72 *17*	115.717	7/2$^+$	[E2]		0.0351	α(K)=0.0276 *4*; α(L)=0.00588 *9*; α(M)=0.001321 *19* α(N)=0.000300 *5*; α(O)=4.32×10^{-5} *6*; α(P)=1.777×10^{-6} *25* B(E2)(W.u.)>0.26
		410.723 *9*	100 *5*	63.916	5/2$^+$	M1+E2	≤1.0	0.037 *5*	α(K)=0.031 *5*; α(L)=0.0047 *4*; α(M)=0.00102 *7* α(N)=0.000234 *15*; α(O)=3.6×10^{-5} *3*; α(P)=2.3×10^{-6} *4* B(M1)(W.u.)>0.0013
		420.090 *9*	5.3 *4*	54.536	5/2$^-$	[E1]		0.00703	α(K)=0.00599 *9*; α(L)=0.000815 *12*; α(M)=0.0001758 *25* α(N)=4.02×10^{-5} *6*; α(O)=6.16×10^{-6} *9*; α(P)=3.91×10^{-7} *6* B(E1)(W.u.)>1.3×10^{-6}
		474.625 *11*	14.4 *7*	0.0	3/2$^-$	[E1]		0.00530	α(K)=0.00452 *7*; α(L)=0.000612 *9*; α(M)=0.0001318 *19* α(N)=3.02×10^{-5} *5*; α(O)=4.63×10^{-6} *7*; α(P)=2.97×10^{-7} *5* B(E1)(W.u.)>2.5×10^{-6}
478.62	13/2$^-$	116.6	0.6 *3*	361.04	13/2$^+$	E1		0.193	α(K)=0.1624 *23*; α(L)=0.0241 *4*; α(M)=0.00521 *8*

$^{157}_{64}Gd_{93}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{157}Gd)$ (continued)

E_i(level)	J^{π}_i	E_{γ}[†‡]	I_{γ}	E_f	J^{π}_f	Mult.[#]	α[&]	Comments
								α(N)=0.001180 *17*; α(O)=0.0001740 *25*; α(P)=9.28×10^{-6} *13* B(E1)(W.u.)=8.E−5 *4*
478.62	13/2$^-$	131.6 *1*	40 *4*	347.05	11/2$^-$			
		206.4	9 *3*	272.22	11/2$^+$	E1	0.0418	α(K)=0.0354 *5*; α(L)=0.00501 *7*; α(M)=0.001082 *16* α(N)=0.000247 *4*; α(O)=3.71×10^{-5} *6*; α(P)=2.17×10^{-6} *3* B(E1)(W.u.)=0.00020 *7*
		251.63 *3*	100 *4*	226.983	9/2$^-$	[E2]	0.1047	α(K)=0.0774 *11*; α(L)=0.0212 *3*; α(M)=0.00484 *7* α(N)=0.001092 *16*; α(O)=0.0001528 *22*; α(P)=4.68×10^{-6} *7* B(E2)(W.u.)=9.5×10^2 *10*
508.93	15/2$^+$	147.93 *11*	68 *11*	361.04	13/2$^+$			
		236.62 *16*	100 *5*	272.22	11/2$^+$			
514.671	7/2$^-$	334.441 *10*	62 *4*	180.229	9/2$^+$			
		383.17 *3*	5.3 *8*	131.451	7/2$^-$			
		398.953 *9*	100 *5*	115.717	7/2$^+$			
		450.761 *10*	92 *6*	63.916	5/2$^+$			I_{γ}: From ^{157}Eu β- decay (1986GrZS); other: Coulomb excitation value is 30 *8*, 99 *5* from (n,n′γ), and 118 *17* from (n,γ) E=resonance.
		517		0.0	3/2$^-$			
524.847	5/2$^+$	344.61 *6*	1.3 *3*	180.229	9/2$^+$			I_{γ}: From ^{157}Eu β- decay (1986GrZS); other: 3.78 *22* from (n,n′γ).
		393.408 *20*	4.6 *5*	131.451	7/2$^-$			
		409.135 *10*	100 *5*	115.717	7/2$^+$			
		460.923 *9*	36.2 *25*	63.916	5/2$^+$			I_{γ}: From ^{157}Eu β- decay (1986GrZS); other: 36.1 *17* from (n,γ) E=thermal, 36.4 *24* from (n,γ) E=resonance, 30.0 *16* from (n,n′γ).
		470.389[@] *26*	7.4 *7*	54.536	5/2$^-$			
		524.835 *18*	11.3 *11*	0.0	3/2$^-$			I_{γ}: From ^{157}Eu β- decay (1986GrZS); other: 11.0 *15* from (n,γ) E=thermal, 7.9 *4* from (n,n′γ), 7.4 *22* from (n,γ) E=resonance.
579.40	(13/2$^-$)	152.86 *7*	100	426.539	11/2$^-$			
607.589	7/2$^{(+)}$	380.38[@] *6*	20 *3*	226.983	9/2$^-$			
		427.355 *15*	100 *10*	180.229	9/2$^+$			
		491.89 *3*	57 *8*	115.717	7/2$^+$			I_{γ}: From ^{157}Eu β- decay (1986GrZS); other: 22.9 *16* from (n,n′γ), 62 *4* from (n,γ) E=thermal, and 42 *8* from (n,γ) E=resonance.
		543.93[@] *6*	7.5 *8*	63.916	5/2$^+$			I_{γ}: other: 21 *4* (^{157}Eu β^- decay).
		553.02 *7*	17.3 *10*	54.536	5/2$^-$			I_{γ}: other: 22 *4* (^{157}Eu β^- decay).
612.1	17/2$^+$	103.2		508.93	15/2$^+$			
		251.4		361.04	13/2$^+$			
617.38	9/2$^-$	345.16 *6*	48. *3*	272.22	11/2$^+$			
		437.06 *6*	42.9 *22*	180.229	9/2$^+$			
		501.70 *4*	100 *7*	115.717	7/2$^+$			
640.33	15/2$^-$	131.3	0.45 *15*	508.93	15/2$^+$	E1	0.1401	α(K)=0.1181 *17*; α(L)=0.01729 *25*; α(M)=0.00374 *6* α(N)=0.000849 *12*; α(O)=0.0001257 *18*; α(P)=6.86×10^{-6} *10* B(E1)(W.u.)=6.8×10^{-5} *24* Mult.: From coulex dataset.
		161.7 *1*	36 *6*	478.62	13/2$^-$			

$^{157}_{64}Gd_{93}$-12

Adopted Levels, Gammas (continued)

$\gamma(^{157}Gd)$ (continued)

E_i(level)	J^π_i	E_γ †‡	I_γ	E_f	J^π_f	Mult.#	α&	Comments
640.33	15/2⁻	279.4	14 3	361.04	13/2⁺	E1	0.0191	α(K)=0.01619 23; α(L)=0.00225 4; α(M)=0.000486 7 α(N)=0.0001110 16; α(O)=1.684×10^{-5} 24; α(P)=1.025×10^{-6} 15 B(E1)(W.u.)=0.00022 6 Mult.: From coulex dataset.
		293.3 1	100 6	347.05	11/2⁻	[E2]	0.0646	α(K)=0.0492 7; α(L)=0.01198 17; α(M)=0.00272 4 α(N)=0.000614 9; α(O)=8.71×10^{-5} 13; α(P)=3.06×10^{-6} 5 B(E2)(W.u.)=7.7×10^{2} 9
664.44	9/2⁺	392.19 4	100 5	272.22	11/2⁺			
		533.18 14	16 10	131.451	7/2⁻			
		548.83 12	13.0 15	115.717	7/2⁺			
682.82	1/2⁺	208.20 4	100 3	474.630	3/2⁺			
		619		63.916	5/2⁺			619γ ray uniquely assigned at this level by 2014Ro25 (^{158}Gd(p,dγ)) is based on L=0,1 or 4. However several references place a close-lying 619.3γ-ray at 683.2, 3/2⁻ level (compatible with L=2); so unless they are two diffrent γ′s, both placements are rather uncertain.
		682.80 5	48 3	0.0	3/2⁻			
683.236	3/2⁺	158.41 3	0.68 19	524.847	5/2⁺			
		208.621 11	4.1 4	474.630	3/2⁺			I_γ: may include transition from 1/2⁺ level at 682.8 keV.
		567.58 4	4.1 4	115.717	7/2⁺	[E2]	0.01007	α(K)=0.00827 12; α(L)=0.001406 20; α(M)=0.000311 5 α(N)=7.09×10^{-5} 10; α(O)=1.056×10^{-5} 15; α(P)=5.60×10^{-7} 8 B(E2)(W.u.)>0.022 I_γ: From ^{157}Eu β- decay (1986GrZS); other: 8.3 10 from (n,n′γ), 5.9 18 from (n,γ) E=thermal, and 7.8 14 from (n,γ) E=resonance.
		619.303 12	100 5	63.916	5/2⁺			I_γ: may include transition from 1/2⁺ level at 682.8 keV.
		628.704 28	2.8 4	54.536	5/2⁻			
		683.162 27	6.5 12	0.0	3/2⁻	[E1]	0.00641	α(K)=0.00532 8; α(L)=0.000849 12; α(M)=0.000186 3 α(N)=4.26×10^{-5} 6; α(O)=6.42×10^{-6} 9; α(P)=3.65×10^{-7} 6 B(E1)(W.u.)>1.3×10^{-7} I_γ: may include transition from 1/2⁺ level at 682.8 keV.
686.667	5/2⁺,7/2⁺	161.820 13	5.4 11	524.847	5/2⁺			I_γ: from ^{157}Eu β- decay; other: 3.4 8 from ^{156}Gd(n,γ) E=resonance and 7.1 11 from ^{157}Gd(n,n′γ).
		212.050 25	3.9 6	474.630	3/2⁺			
		252.3 2	2.8 14	434.426	5/2⁻			
		506.43 3	5.2 8	180.229	9/2⁺			
		555.23 12	2.2 4	131.451	7/2⁻			
		570.937 13	100 5	115.717	7/2⁺			
		622.751 13	62 4	63.916	5/2⁺			I_γ: from ^{157}Eu β- decay; other: 68 6 from ^{156}Gd(n,γ) E=resonance and 48.9 25 from ^{157}Gd(n,n′γ).
		632.23 5	3.0 6	54.536	5/2⁻			
701.39	(1/2)⁻	268	26 6	434.426	5/2⁻			
		638[c]	17 4	63.916	5/2⁺			E_γ: Placement requires M2 character, so placement is doubtful.
		701.39 4	100 13	0.0	3/2⁻			

Adopted Levels, Gammas (continued)

γ(^{157}Gd) (continued)

E_i(level)	J^{π}_i	E_γ †‡	I_γ	E_f	J^{π}_f	Mult.#	α&	Comments
722.9?		607.1[c] *2*	100 *50*	115.717	7/2+			
		668.5[c] *2*	26 *7*	54.536	5/2−			
729.23	3/2−	613.73[c] *14*	70 *30*	115.717	7/2+			E_γ: Placement requires M2 character, so placement is doubtful. Also 2014Ro25 ((^{158}Gd(p,dγ)) did not observe 614γ.
		674.68 *4*	100 *2*	54.536	5/2−			
		729.24 *4*	47.8 *4*	0.0	3/2−			
741.72	9/2+	226.5 *4*	<62	514.671	7/2−			
		561.40 *5*	100 *5*	180.229	9/2+			
		626.19 *7*	96 *5*	115.717	7/2+			
746.9	(3/2−)	221	8 *3*	524.847	5/2+			
		231	14 *3*	514.671	7/2−			
		273	8 *3*	474.630	3/2+			
		693	100 *10*	54.536	5/2−			
		748		0.0	3/2−			
751.436	3/2+	226.63 *3*	3.2 *6*	524.847	5/2+			
		276.86 *5*	3.5 *7*	474.630	3/2+			
		635.75 *9*	3.9 *8*	115.717	7/2+			I_γ: from ^{157}Eu β- decay; other: 8.5 *8* from ^{156}Gd(n,γ) E=thermal and 4.6 *3* from ^{157}Gd(n,n′γ).
		687.502 *13*	100 *10*	63.916	5/2+			
		696.94 *4*	6.1 *6*	54.536	5/2−			
		750.8[c] *6*	≤12	0.0	3/2−			
762.670	3/2−	238.49[@] *19*	5.4 *12*	524.847	5/2+			
		288.023 *19*	18.6 *15*	474.630	3/2+			
		328.3 *2*	4.0 *15*	434.426	5/2−			
		762.69 *3*	100 *5*	0.0	3/2−			
771.302	(7/2+)	163.7 *2*	4.2 *24*	607.589	7/2(+)			
		246.5 *2*	4.2 *24*	524.847	5/2+			
		543.93[@] *6*	≤21	226.983	9/2−			
		591.097 *19*	85 *8*	180.229	9/2+			
		655.592 *28*	100 *10*	115.717	7/2+			
		707.46 *9*	25 *4*	63.916	5/2+			I_γ: from ^{157}Eu β- decay; other: 57 *9* from ^{156}Gd(n,γ) E=thermal and 28.3 *18* from ^{157}Gd(n,n′γ).
		716.92 *10*	15 *4*	54.536	5/2−			
788.54	5/2−	657.07 *4*	54 *3*	131.451	7/2−			I_γ: from ^{157}Gd(n,n′γ); other: 80 *8* from ^{156}Gd(n,γ) E=thermal.
		734.05 *4*	100 *5*	54.536	5/2−			
		788.46 *6*	36.0 *20*	0.0	3/2−			
793.67	1/2−	358.92[c] *15*	6.7 *19*	434.426	5/2−			I_γ: from ^{156}Gd(n,γ) E=resonance; other: 17.2 *13* from ^{157}Gd(n,n′γ).
		739.10 *7*	10 *4*	54.536	5/2−			I_γ: from ^{156}Gd(n,γ) E=resonance; other: 35 *4* from ^{157}Gd(n,n′γ) and 8.3 *5* from ^{156}Gd(n,γ) E=thermal.
		793.68 *5*	100 *6*	0.0	3/2−			
801.32	17/2−	161.0 *1*	19 *8*	640.33	15/2−			
		189.1	1.2 *5*	612.1	17/2+	E1	0.0527	α(K)=0.0446 *7*; α(L)=0.00634 *9*; α(M)=0.001371 *20*

$\gamma(^{157}Gd)$ (continued)

E_i(level)	J^π_i	E_γ[†‡]	I_γ	E_f	J^π_f	Mult.[#]	α[&]	Comments
								α(N)=0.000312 *5*; α(O)=4.68×10^{-5} *7*; α(P)=2.71×10^{-6} *4* B(E1)(W.u.)=0.00012 *6*
801.32	17/2$^-$	292.4	7.8 *17*	508.93	15/2$^+$	E1	0.01699	α(K)=0.01444 *21*; α(L)=0.00200 *3*; α(M)=0.000432 *6* α(N)=9.88×10^{-5} *14*; α(O)=1.499×10^{-5} *21*; α(P)=9.17×10^{-7} *13* B(E1)(W.u.)=0.00021 *6*
		322.7 *1*	100 *8*	478.62	13/2$^-$	[E2]	0.0482	α(K)=0.0373 *6*; α(L)=0.00850 *12*; α(M)=0.00192 *3* α(N)=0.000435 *7*; α(O)=6.21×10^{-5} *9*; α(P)=2.36×10^{-6} *4* B(E2)(W.u.)=9.3×10^2 *14*
806.67	11/2$^+$	534.45 *11*	100	272.22	11/2$^+$			
809.13	3/2$^-$	284.26 *20*	6.8 *15*	524.847	5/2$^+$			E_γ: average of 284.09 *23* (^{156}Gd(n,γ) E=resonance) and 284.44 *11* (^{157}Gd(n,n′γ)). I_γ: from ^{156}Gd(n,γ) E=resonance; other: 14.3 *7* from ^{157}Gd(n,n′γ) and 8 *6* from ^{156}Gd(n,γ) E=thermal.
		334.36 *20*	12.3 *18*	474.630	3/2$^+$			I_γ: from ^{156}Gd(n,γ) E=resonance; other: 74 *4* from ^{157}Gd(n,n′γ) and 9.2 *17* from ^{156}Gd(n,γ) E=thermal.
		754.59 *3*	100 *5*	54.536	5/2$^-$			
		809.25 *10*	16 *5*	0.0	3/2$^-$			I_γ: from ^{156}Gd(n,γ) E=resonance; other: 23.3 *13* from ^{157}Gd(n,n′γ) and 24.0 *5* from ^{156}Gd(n,γ) E=thermal.
814.11	(5/2$^-$)	339.19 *12*	22.2 *12*	474.630	3/2$^+$			I_γ: from ^{157}Gd(n,n′γ); other: 44 *8* from ^{156}Gd(n,γ) E=thermal and 13 *7* from ^{157}Eu β- decay.
		682.60 *6*	58 *17*	131.451	7/2$^-$			I_γ: from ^{157}Eu β- decay relative to I_γ of 698.
		698.51 *9*	45.5 *24*	115.717	7/2$^+$			E_γ: weighted average of: 698.30 *9* (^{156}Gd(n,γ) E=th), 698.32 *10* (^{157}Gd(n,n′γ)), 698.59 *16* (^{156}Gd(n,γ) E=resonance), and 698.62 *5* (^{157}Eu β^- decay). I_γ: from ^{157}Gd(n,n′γ); other: 77 *6* from ^{156}Gd(n,γ) E=thermal.
		750.24 *10*	100 *5*	63.916	5/2$^+$			
		759.75 *15*	15.6 *12*	54.536	5/2$^-$			I_γ: from ^{157}Gd(n,n′γ); other: 54 *5* from ^{156}Gd(n,γ) E=thermal.
		814.22 *10*	47 *3*	0.0	3/2$^-$			
816.50	(5/2$^+$)	685.14 *10*	40.7 *18*	131.451	7/2$^-$			I_γ: from ^{157}Gd(n,n′γ); other: 24 *4* from ^{156}Gd(n,γ) E=thermal.
		700.56 *19*	43 *3*	115.717	7/2$^+$			
		752.55 *8*	100 *5*	63.916	5/2$^+$			
		816.50 *9*	48 *3*	0.0	3/2$^-$			I_γ: from ^{157}Gd(n,n′γ); other: 25.8 *19* from ^{156}Gd(n,γ) E=thermal.
816.574	(5/2,7/2$^-$)	129.5 *2*	4.1 *22*	686.667	5/2$^+$,7/2$^+$			
		209.0 *2*	6 *3*	607.589	7/2$^{(+)}$			
		291.69 *7*	7.4 *19*	524.847	5/2$^+$			
		342.0		474.630	3/2$^+$			
		685.2 *2*	16 *8*	131.451	7/2$^-$			
		700.856 *16*	100 *10*	115.717	7/2$^+$			
		752.61 *4*	87 *9*	63.916	5/2$^+$			
		762.7[bc] *6*	≈11[b]	54.536	5/2$^-$			
		816.64 *4*	24 *4*	0.0	3/2$^-$			
831.9	19/2$^+$	219.9		612.1	17/2$^+$			

$^{157}_{64}Gd_{93}$-15

Adopted Levels, Gammas (continued)

γ(^{157}Gd) (continued)

E_i(level)	J^{π}_i	E_{γ}†‡	I_{γ}	E_f	J^{π}_f	Mult.#	α&	Comments
831.9	19/2+	323.1		508.93	15/2+			
840.42	7/2−	613.10 15	19.7 21	226.983	9/2−			E_{γ}: weighted average of: 612.94 22 (^{156}Gd(n,γ) E=th) and 613.20 21 (^{157}Gd(n,n′γ)). I_{γ}: from ^{157}Gd(n,n′γ); other: 39 8 from ^{156}Gd(n,γ) E=thermal.
		785.90 9	61 3	54.536	5/2−			
		840.9 2	100 13	0.0	3/2−			E_{γ}: average of: 840.68 9 (^{157}Gd(n,n′γ)) and 841.06 9 (^{156}Gd(n,γ) E=th).
849.3	11/2+,13/2+	488.23 14	100	361.04	13/2+			
887.93	5/2−	833.19 13	100 18	54.536	5/2−			
		887.97 6	91 5	0.0	3/2−			
919.31	(7/2+,9/2−)	647.65@ 20	11 2	272.22	11/2+			E_{γ}: average of: 647.57 17 (^{157}Gd(n,n′γ)) and 647.75 19 (^{156}Gd(n,γ) E=th). I_{γ}: from ^{157}Gd(n,n′γ); other: 69 12 from ^{156}Gd(n,γ) E=thermal.
		739.34 12	89 28	180.229	9/2+			
		803.35@ 5	80 6	115.717	7/2+			
		865.28@ 9	100 6	54.536	5/2−			E_{γ}: weighted average of: 865.05 20 (^{157}Eu β^- decay), 865.22 5 (^{157}Gd(n,n′γ)), and 865.48 8 (^{156}Gd(n,γ) E=th).
939.3	21/2+	107.3		831.9	19/2+			
		327.2		612.1	17/2+			
1002.53	19/2−	171.3	0.9 3	831.9	19/2+	E1	0.0685	α(K)=0.0580 9; α(L)=0.00830 12; α(M)=0.00180 3 α(N)=0.000408 6; α(O)=6.11×10^{-5} 9; α(P)=3.48×10^{-6} 5 B(E1)(W.u.)=0.00015 6 Mult.: From coulex dataset.
		201 1	19 14	801.32	17/2−			
		362.2 1	100 14	640.33	15/2−	[E2]	0.0342	α(K)=0.0269 4; α(L)=0.00570 8; α(M)=0.001281 18 α(N)=0.000290 4; α(O)=4.19×10^{-5} 6; α(P)=1.735×10^{-6} 25 B(E2)(W.u.)=6.7×10^{2} 15
		390.5	25 4	612.1	17/2+	[E1]	0.00835	α(K)=0.00712 10; α(L)=0.000972 14; α(M)=0.000210 3 α(N)=4.80×10^{-5} 7; α(O)=7.33×10^{-6} 11; α(P)=4.62×10^{-7} 7 B(E1)(W.u.)=0.00036 9
1041.50	1/2,3/2−	1041.5 2	100	0.0	3/2−			
1049.68		615.2 3	42.3 24	434.426	5/2−			
		934.24@ 8	48.8 24	115.717	7/2+			I_{γ}: from ^{157}Gd(n,n′γ); other: 27 7 from ^{157}Eu β- decay.
		985.69 4	100 5	63.916	5/2+			
1059.67	3/2,5/2	584.92 12	92 11	474.630	3/2+			I_{γ}: from ^{156}Gd(n,γ) E=thermal; other: 44 5 from ^{157}Gd(n,n′γ).
		625.31 25	30 8	434.426	5/2−			
		996.13 14	120 20	63.916	5/2+			
		1059.53 11	100 10	0.0	3/2−			
1060.07	3/2+,5/2	585.46 20	55 17	474.630	3/2+			
		625.6 2	45 14	434.426	5/2−			
		944.21 10	100 31	115.717	7/2+			
		996.38 12	93 28	63.916	5/2+			

$^{157}_{64}Gd_{93}$-16

γ(^{157}Gd) (continued)

E_i(level)	J^π_i	E_γ[†‡]	I_γ	E_f	J^π_f	Comments
1060.07	3/2$^+$,5/2	1060.06 *10*	86 *28*	0.0	3/2$^-$	
1185.62	21/2$^-$	183.3		1002.53	19/2$^-$	
		353.6		831.9	19/2$^+$	
		384.3 *1*		801.32	17/2$^-$	
1231.50	5/2$^+$,7/2,9/2$^+$	1051.57 *15*	55 *17*	180.229	9/2$^+$	
		1115.53[c] *15*	40 *12*	115.717	7/2$^+$	
		1167.38 *12*	100 *24*	63.916	5/2$^+$	
1241.1	23/2$^+$	409.2	100	831.9	19/2$^+$	
1247.20	1/2$^+$,3/2$^+$	560.1[c] *8*	100 *4*	686.667	5/2$^+$,7/2$^+$	I_γ: from ^{156}Gd(n,γ) E=thermal; other: 34 *9* from ^{156}Gd(n,γ) E=resonance relative to 722 γ.
		722.55[c] *10*	76 *7*	524.847	5/2$^+$	
		772.62 *8*	57 *4*	474.630	3/2$^+$	
		1247.10 *10*	55 *4*	0.0	3/2$^-$	
1316.39	1/2$^-$,3/2$^-$	1316.38 *6*	100	0.0	3/2$^-$	
1344.8	25/2$^+$	405.5	100	939.3	21/2$^+$	
1349.13	1/2$^-$	1285.20 *6*	100 *4*	63.916	5/2$^+$	
		1349.18 *13*	53 *5*	0.0	3/2$^-$	
1387.06	1/2$^-$,3/2$^-$	1387.05 *5*	100	0.0	3/2$^-$	
1423.9	23/2$^-$	421.4		1002.53	19/2$^-$	
		484.5		939.3	21/2$^+$	
1490.07	3/2$^+$	1435.59 *9*	38.9 *23*	54.536	5/2$^-$	
		1490.03 *6*	100 *3*	0.0	3/2$^-$	
1521.36	3/2$^-$	1457.44 *17*	100	63.916	5/2$^+$	
1526.12	1/2,3/2	1526.11 *6*	100	0.0	3/2$^-$	
1552.2	5/2$^+$	1420.97 *18*	95 *19*	131.451	7/2$^-$	
		1497.30 *30*	100 *20*	54.536	5/2$^-$	
		1552.35 *22*	88 *17*	0.0	3/2$^-$	
1563.1	(3/2$^-$,5/2,7/2$^-$)	1431.8 *4*	58 *21*	131.451	7/2$^-$	
		1507.7 *8*	64 *25*	54.536	5/2$^-$	
		1563.6 *6*	100 *32*	0.0	3/2$^-$	
1589.68	1/2,3/2	1589.67 *12*	100	0.0	3/2$^-$	
1589.8	3/2$^+$,5/2$^+$	1064.74 *20*	33 *6*	524.847	5/2$^+$	
		1115.55 *16*	100 *12*	474.630	3/2$^+$	
		1154.87 *22*	46 *7*	434.426	5/2$^-$	
1614.13	(3/2$^-$)	1482.56 *20*	59 *9*	131.451	7/2$^-$	
		1498.55 *10*	81 *5*	115.717	7/2$^+$	
		1613.83 *16*	100 *12*	0.0	3/2$^-$	
1623.1	25/2$^-$	381.9		1241.1	23/2$^+$	
		437.5		1185.62	21/2$^-$	
1658.76	1/2$^-$,3/2$^-$	1604.20 *10*	100 *6*	54.536	5/2$^-$	
		1658.9 *3*	91 *16*	0.0	3/2$^-$	
1667.58	(1/2,3/2)$^-$	1667.57 *11*	100	0.0	3/2$^-$	
1732.5	27/2$^+$	491.4	100	1241.1	23/2$^+$	

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$\gamma(^{157}Gd)$ (continued)

E_i(level)	J_i^π	E_γ †‡	I_γ	E_f	J_f^π
1735.6	5/2+	984.23 *22*	29 *7*	751.436	3/2+
		1221.20 *30*	31 *7*	514.671	7/2−
		1301.13 *13*	100 *12*	434.426	5/2−
1824.10	1/2−,3/2−	1769.55 *9*	100	54.536	5/2−
1825.6	5/2+	1310.89 *15*	37 *4*	514.671	7/2−
		1350.86 *21*	9.4 *19*	474.630	3/2+
		1391.24 *6*	100 *6*	434.426	5/2−
		1709.8 *4*	9 *2*	115.717	7/2+
1827.3	29/2+	482.5	100	1344.8	25/2+
1844.91		1330.22 *6*	100 *3*	514.671	7/2−
		1665.6 *6*	13 *5*	180.229	9/2+
1867.94		1804.1 *3*	61 *10*	63.916	5/2+
		1867.90 *18*	100 *11*	0.0	3/2−
1896.4	27/2−	472.5	100	1423.9	23/2−
1905.9	(11/2−)	1326.6 *2*	100 *15*	579.40	(13/2−)
		1478.8 *3*	15.5 *57*	426.539	11/2−
		1543.6 *5*	34 *9*	361.04	13/2+
		1632.8 *4*	13 *5*	272.22	11/2+
		1679.8 *5*	56 *12*	226.983	9/2−
		1724.9 *4*	25 *7*	180.229	9/2+
1927.47	3/2+,5/2,7/2−	1811.8 *4*	49 *21*	115.717	7/2+
		1927.45 *8*	100 *3*	0.0	3/2−
1956.0	1/2−,3/2−	1956	100	0.0	3/2−
1976.0	1/2,3/2	1976		0.0	3/2−
2073.0	(1/2,3/2)	2073	100	0.0	3/2−
2108.7	29/2+	485.6	100	1623.1	25/2−
2131.0		2131	100	0.0	3/2−
2180.0		2180	100	0.0	3/2−
2200.0	1/2−,3/2−	2200	100	0.0	3/2−
2250.0		2250	100	0.0	3/2−
2253.0		2253	100	0.0	3/2−
2290.0	1/2−,3/2−	2290		0.0	3/2−
2306.0		2306		0.0	3/2−
2335.0	1/2−,3/2−	2335	100	0.0	3/2−
2346.0		2346	100	0.0	3/2−
2397.0		2397	100	0.0	3/2−
2402.0		2402	100	0.0	3/2−
2446.0		2446	100	0.0	3/2−
2488.0		2488	100	0.0	3/2−
2504.0		2504	100	0.0	3/2−
2509.0		2509	100	0.0	3/2−
2519.0		2519	100	0.0	3/2−
2527.0		2527	100	0.0	3/2−
2537.0		2537	100	0.0	3/2−
2542.0		2542	100	0.0	3/2−
2547.0		2547	100	0.0	3/2−
2556.0		2556	100	0.0	3/2−
2564.0		2564	100	0.0	3/2−
2581.0		2581	100	0.0	3/2−
2592.0	1/2−,3/2−	2592	100	0.0	3/2−
2594.0		2594	100	0.0	3/2−
2633.0	1/2−,3/2−	2633	100	0.0	3/2−
2657.0		2657	100	0.0	3/2−
2674.3		2620	100	54.536	5/2−
		2674	96 *21*	0.0	3/2−
2689.0		2689	100	0.0	3/2−
2694.0		2694	100	0.0	3/2−
2706.2		2575	100	131.451	7/2−
		2706	68 *10*	0.0	3/2−
2721.0		2721	100	0.0	3/2−
2744.0		2744	100	0.0	3/2−
2760.0		2760		0.0	3/2−
2778.4		2663	100	115.717	7/2+
		2778	86 *19*	0.0	3/2−
2787.0		2787	100	0.0	3/2−
2798.0		2798	100	0.0	3/2−
2827.0		2763	75 *11*	63.916	5/2+
		2827	100	0.0	3/2−
2841.0		2841	100	0.0	3/2−
2846.0		2846	100	0.0	3/2−
2858.0		2858	100	0.0	3/2−
2863.0		2863	100	0.0	3/2−
2883.0		2883	100	0.0	3/2−
2906.0		2906	100	0.0	3/2−
2916.3		2785	98 *17*	131.451	7/2−
		2916	100	0.0	3/2−
2925.3		2871	35 *7*	54.536	5/2−
		2925	100	0.0	3/2−
3020.3		2966	60 *9*	54.536	5/2−
		3020	100	0.0	3/2−
3035.0		3035	100	0.0	3/2−
3040.0		3040	100	0.0	3/2−
3049.4		2934	100	115.717	7/2+
		3049	54 *16*	0.0	3/2−
3057.0		3057	100	0.0	3/2−
3078.3		2947	79 *18*	131.451	7/2−

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Adopted Levels, Gammas (continued)

$\gamma(^{157}Gd)$ (continued)

E_i(level)	J^π_i	E_γ †‡	I_γ	E_f	J^π_f	E_i(level)	J^π_i	E_γ †‡	I_γ	E_f	J^π_f	E_i(level)	J^π_i	E_γ †‡	I_γ	E_f	J^π_f
3078.3		3078	100	0.0	$3/2^-$	3239.0		3239	100	0.0	$3/2^-$	3506.0		3506	100	0.0	$3/2^-$
3084.3		3030	100	54.536	$5/2^-$	3251.0		3251	100	0.0	$3/2^-$	3528.0		3528	100	0.0	$3/2^-$
		3084	81 *11*	0.0	$3/2^-$	3268.0		3268	100	0.0	$3/2^-$	3663.0		3663	100	0.0	$3/2^-$
3088.0		3088	100	0.0	$3/2^-$	3272.0		3272	100	0.0	$3/2^-$	3680.0		3680	100	0.0	$3/2^-$
3100.0		3100	100	0.0	$3/2^-$	3288.0		3288	100	0.0	$3/2^-$	3684.0		3684	100	0.0	$3/2^-$
3106.0		3106	100	0.0	$3/2^-$	3333.0		3333	100	0.0	$3/2^-$	3713.0		3713	100	0.0	$3/2^-$
3131.0		3131	100	0.0	$3/2^-$	3346.0		3346	100	0.0	$3/2^-$	3717.0		3717	100	0.0	$3/2^-$
3154.0		3154	100	0.0	$3/2^-$	3356.0		3356	100	0.0	$3/2^-$	3734.0		3734	100	0.0	$3/2^-$
3158.0		3094	100	63.916	$5/2^+$	3375.0		3375	100	0.0	$3/2^-$	3739.0		3739	100	0.0	$3/2^-$
		3158	53 *10*	0.0	$3/2^-$	3413.0		3413	100	0.0	$3/2^-$	3775.0		3775	100	0.0	$3/2^-$
3162.0		3162	100	0.0	$3/2^-$	3456.0		3456	100	0.0	$3/2^-$	3821.3		3767	100	54.536	$5/2^-$
3228.0		3228	100	0.0	$3/2^-$	3472.0		3472	100	0.0	$3/2^-$			3821	96 *38*	0.0	$3/2^-$
3233.0		3233	100	0.0	$3/2^-$	3479.0		3479	100	0.0	$3/2^-$	3842.1		3842	100	0.0	$3/2^-$

† The data are primarily from the β- decay of ^{157}Eu (1986GrZS), and secondarily from Coulomb excitation and from secondary γ's from (n,γ).

‡ The unplaced γ's are not repeated here, see ^{157}Eu β- decay, (n,n$'\gamma$), and (n,γ). The primary γ's from the ^{156}Gd(n,γ) reaction with various energy neutrons are not given here; see those reactions.

From ^{157}Eu β- decay (1966Ha23,1966Fu05).

@ Differ by 3σ or more from calculated value.

& Additional information 3.

[a] 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.

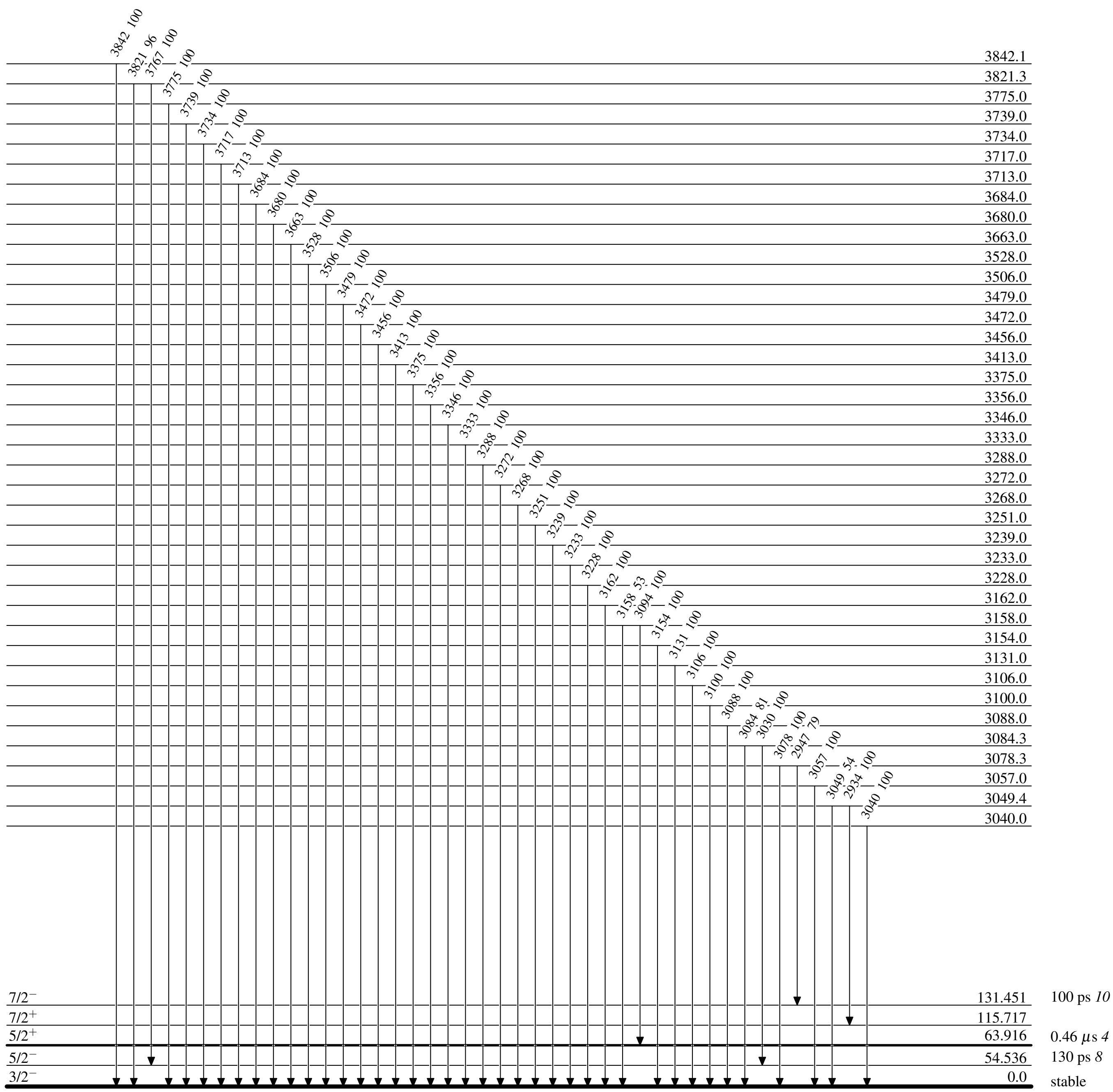
[b] Multiply placed with intensity suitably divided.

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

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

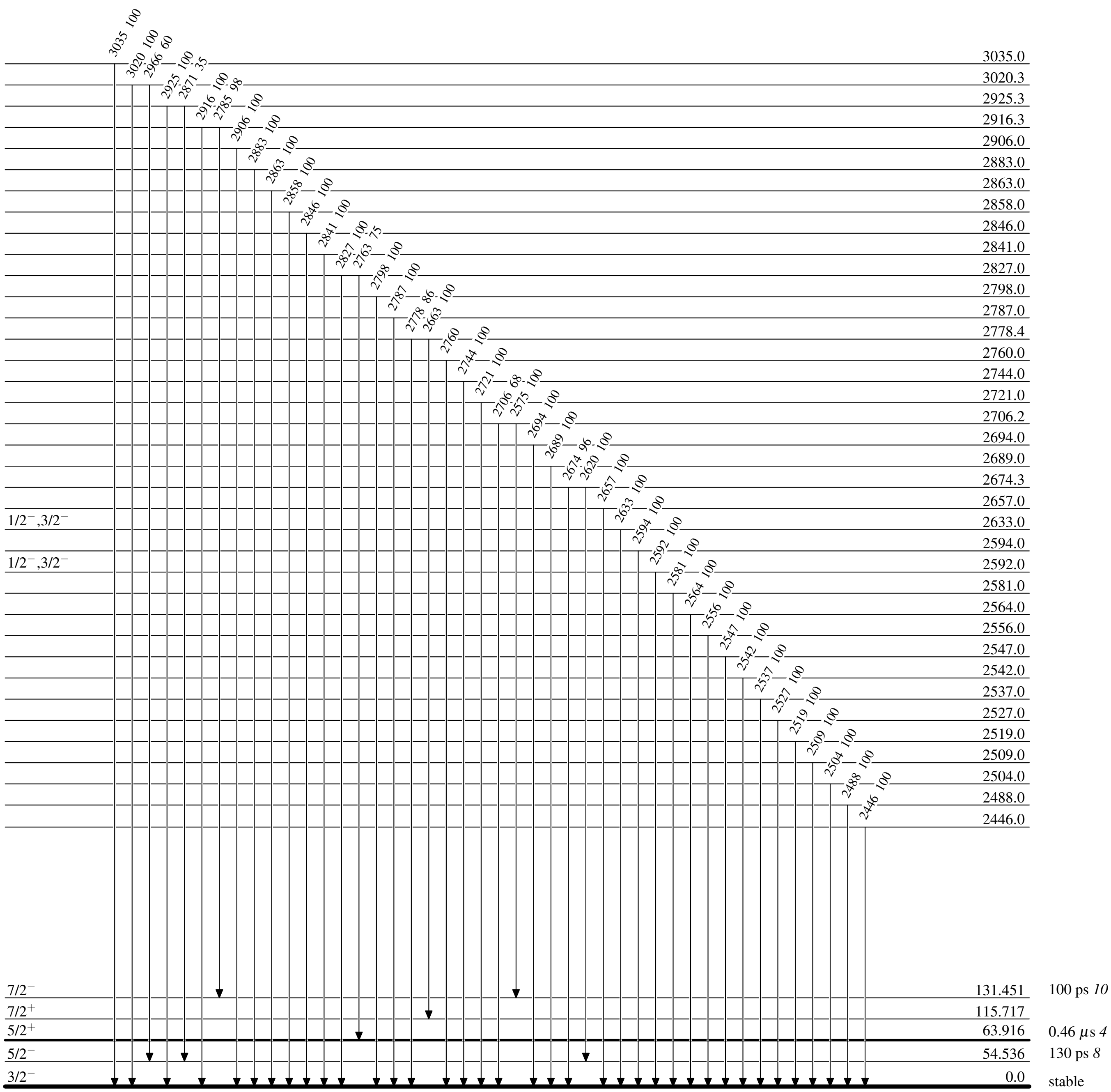


$^{157}_{64}Gd_{93}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

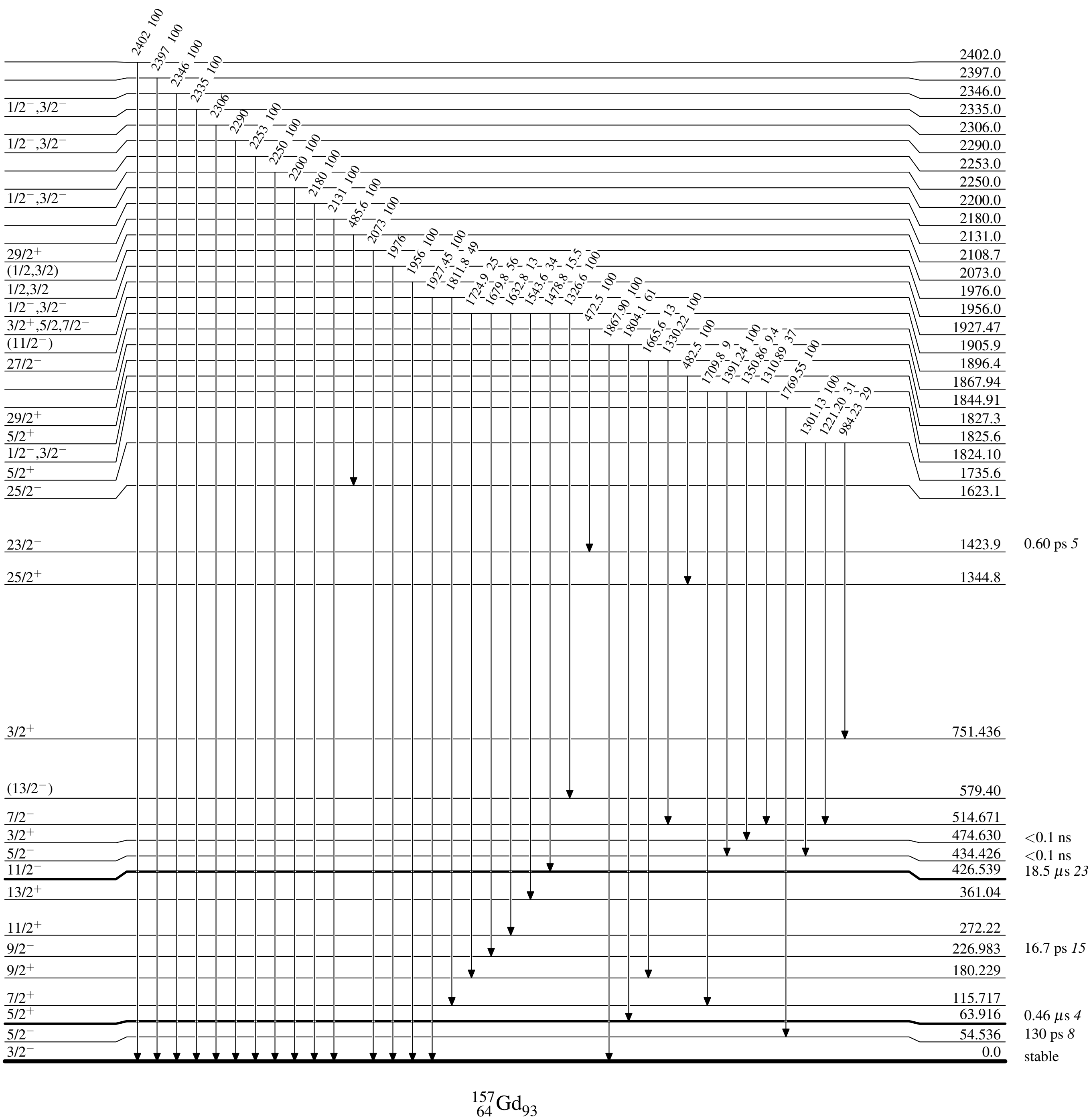


$^{157}_{64}Gd_{93}$

Adopted Levels, Gammas

Level Scheme (continued)

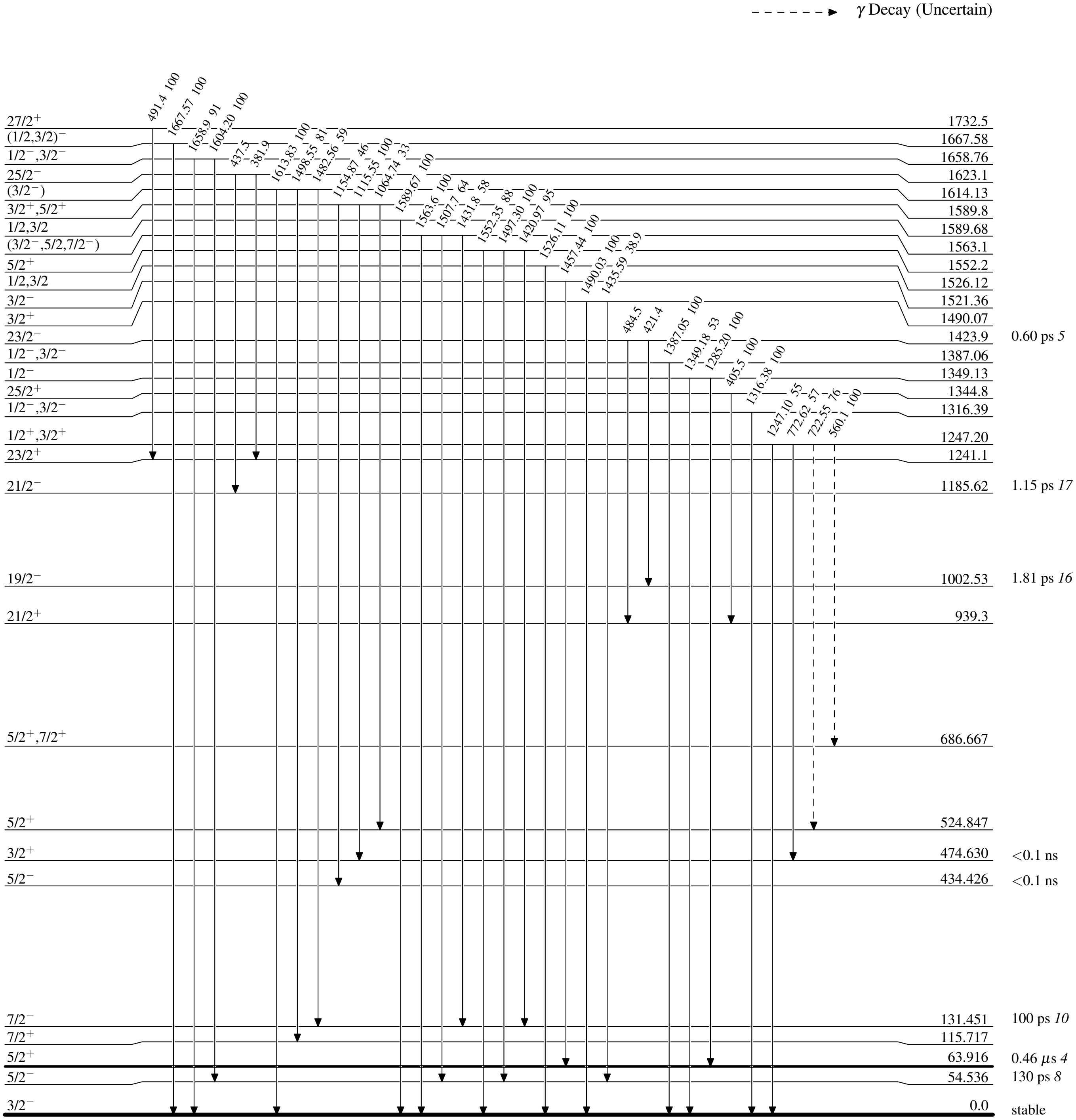
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

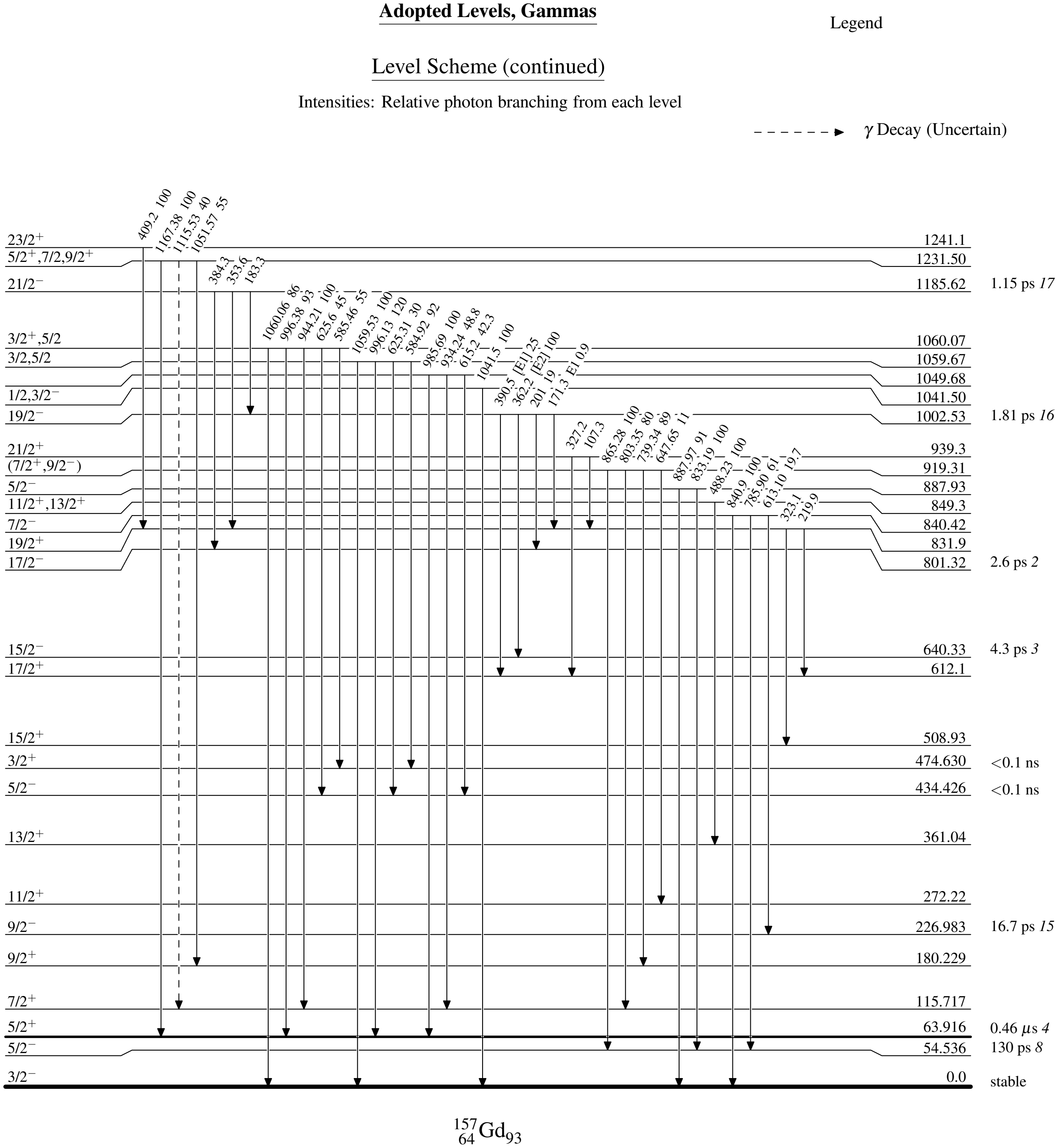


$^{157}_{64}Gd_{93}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

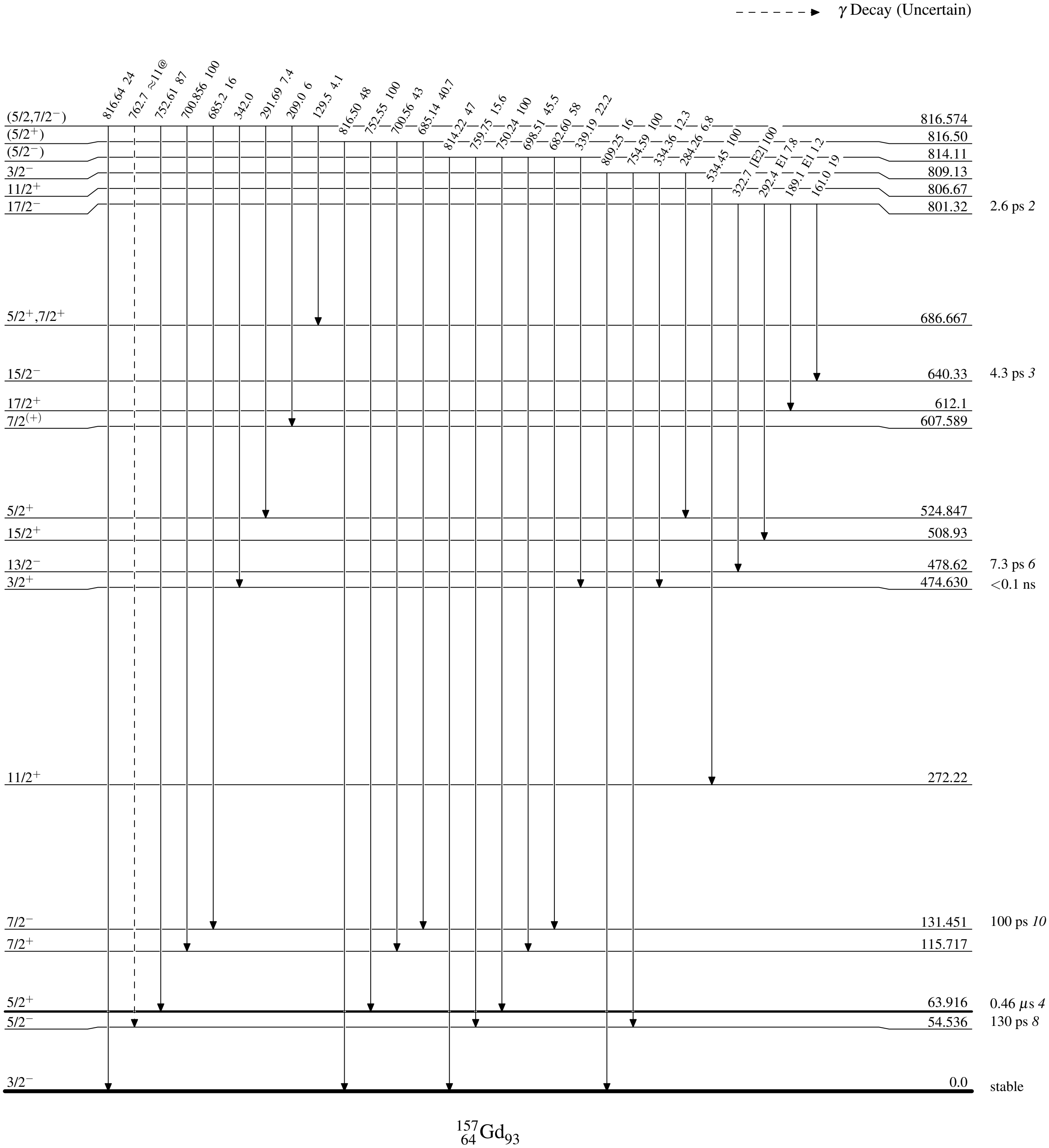


Adopted Levels, Gammas

Legend

Level Scheme (continued)

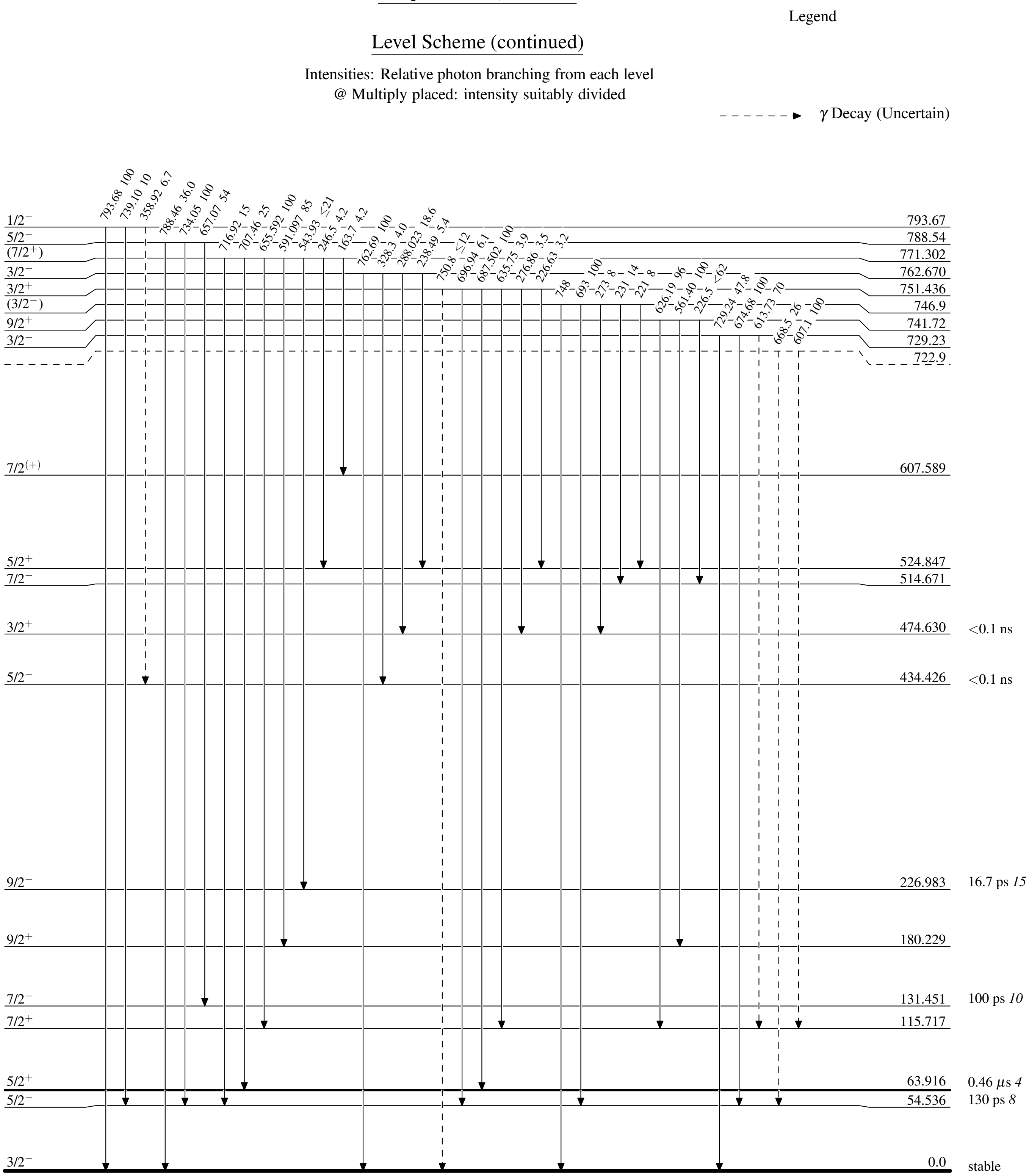
Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



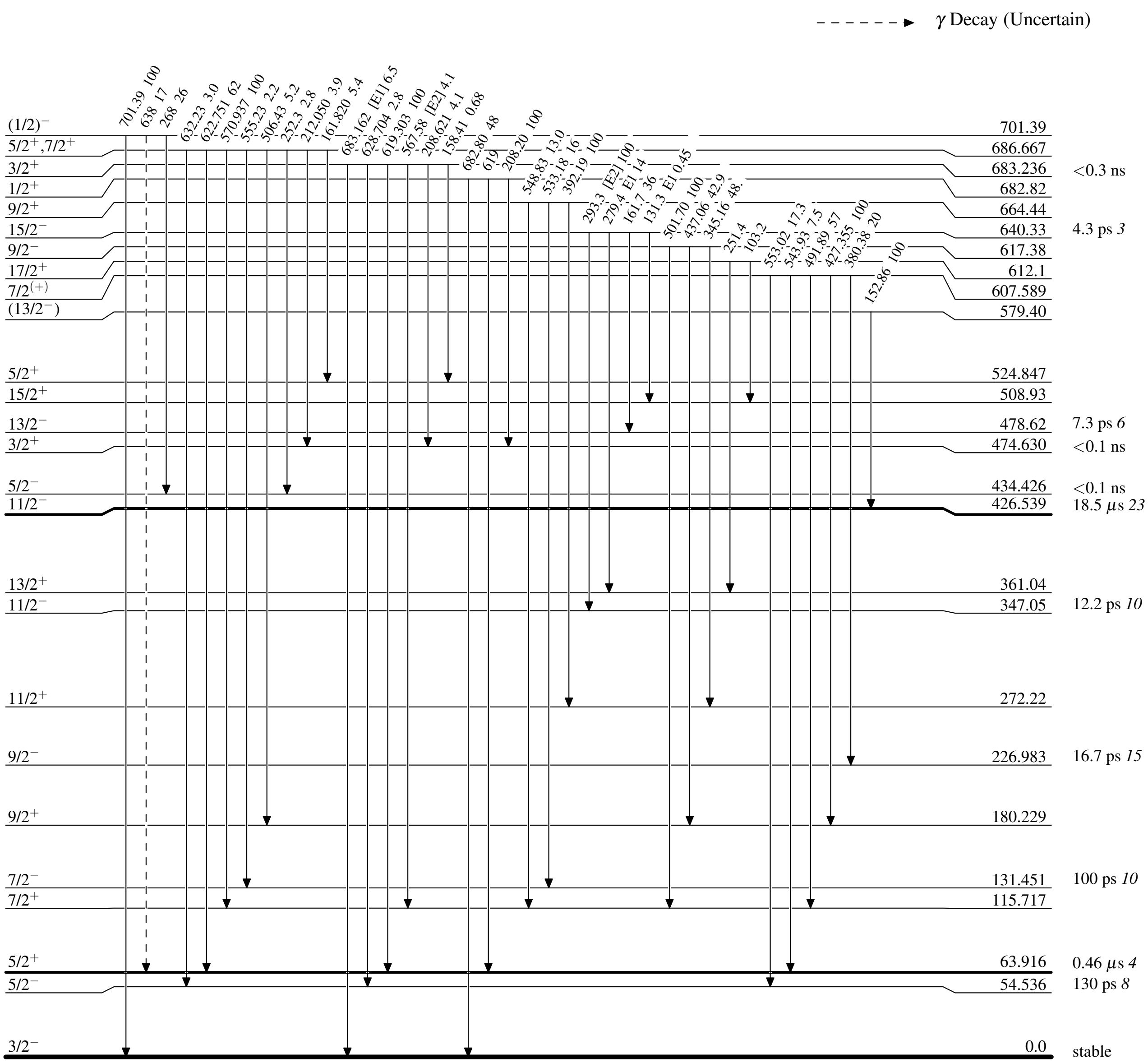
$^{157}_{64}Gd_{93}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

Legend

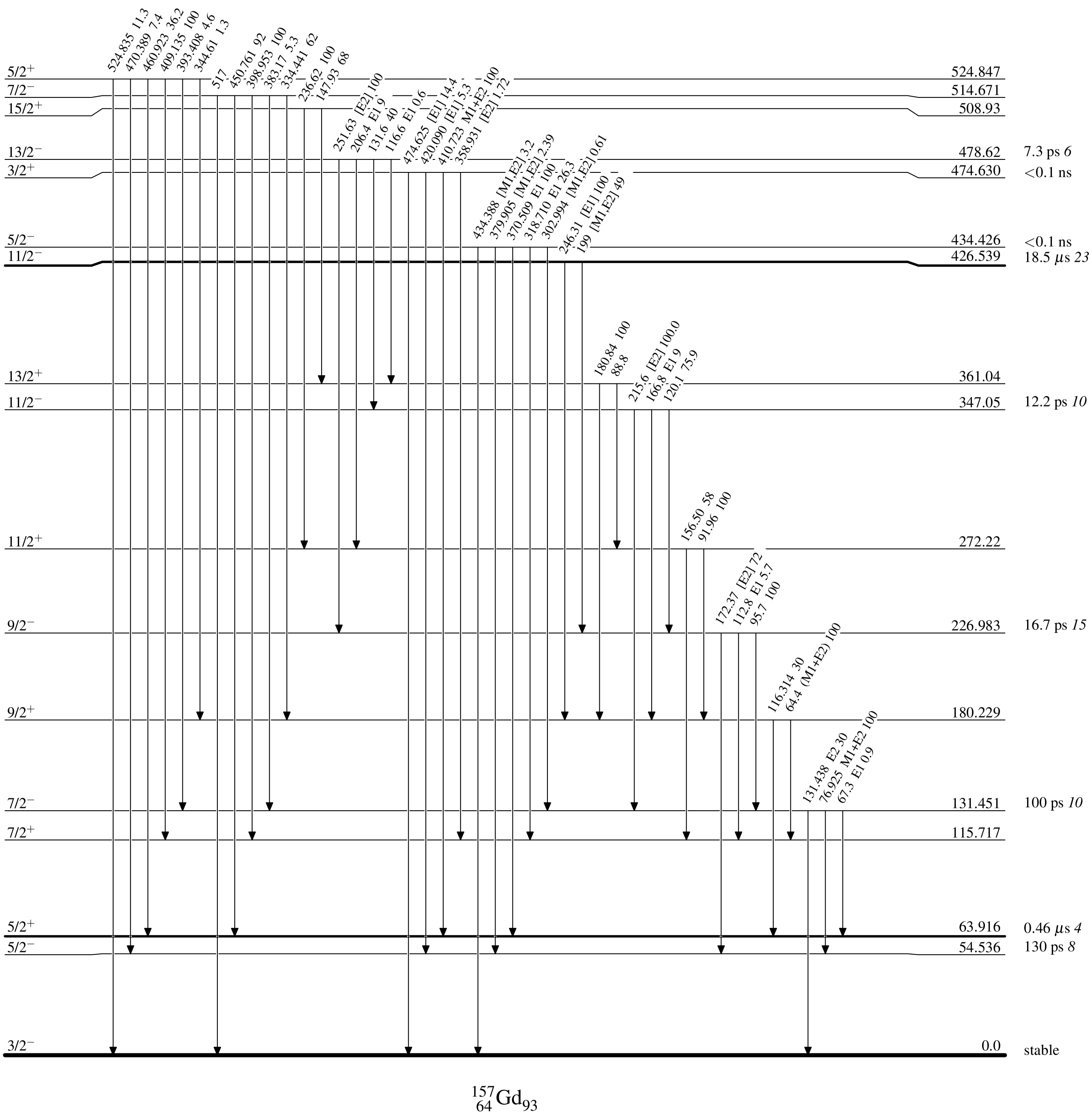


$^{157}_{64}Gd_{93}$

Adopted Levels, Gammas

Level Scheme (continued)

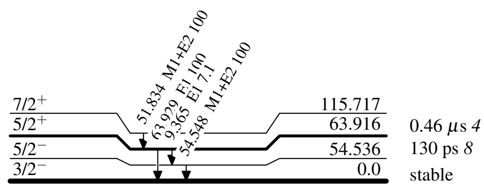
Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas

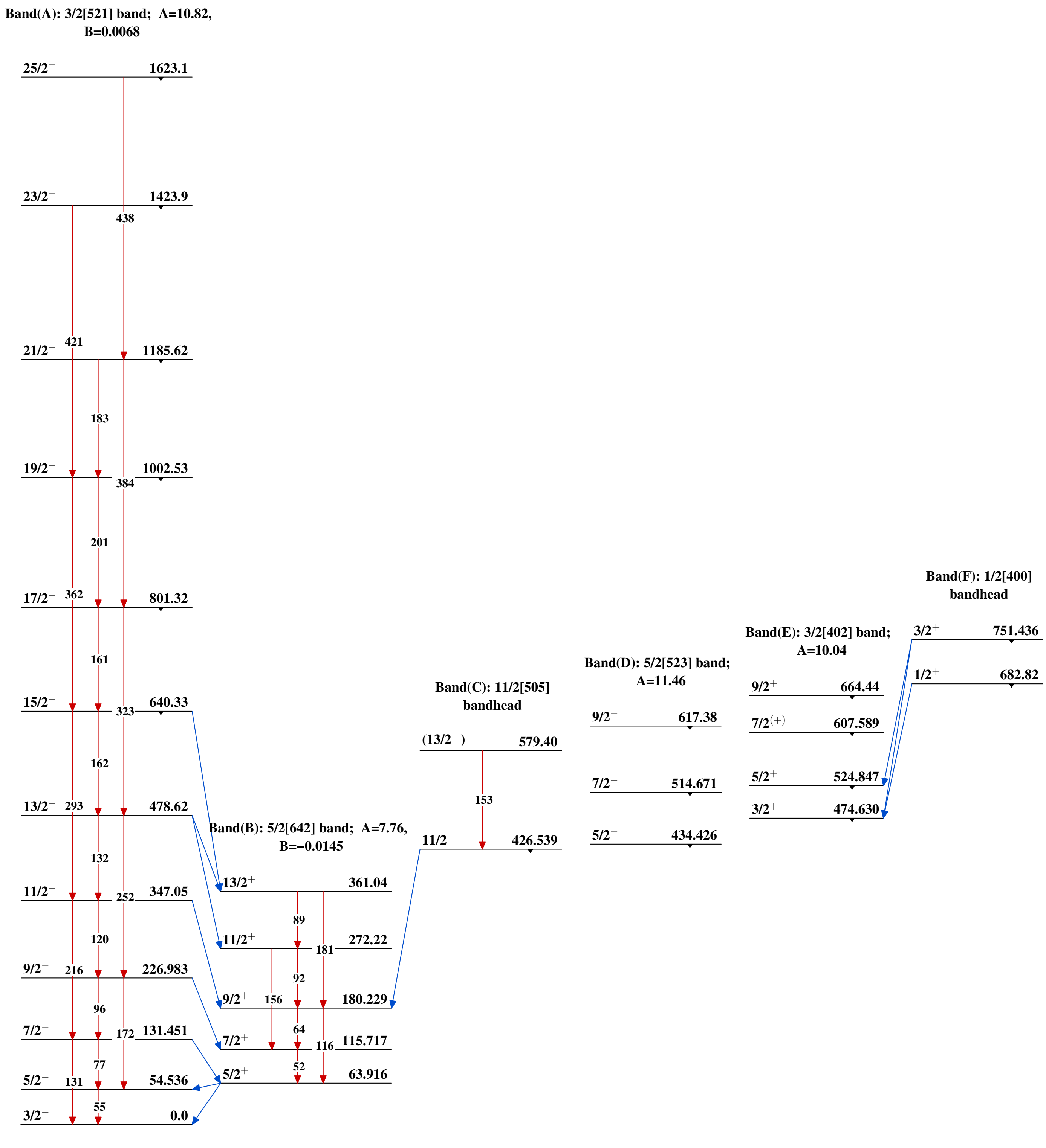
Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



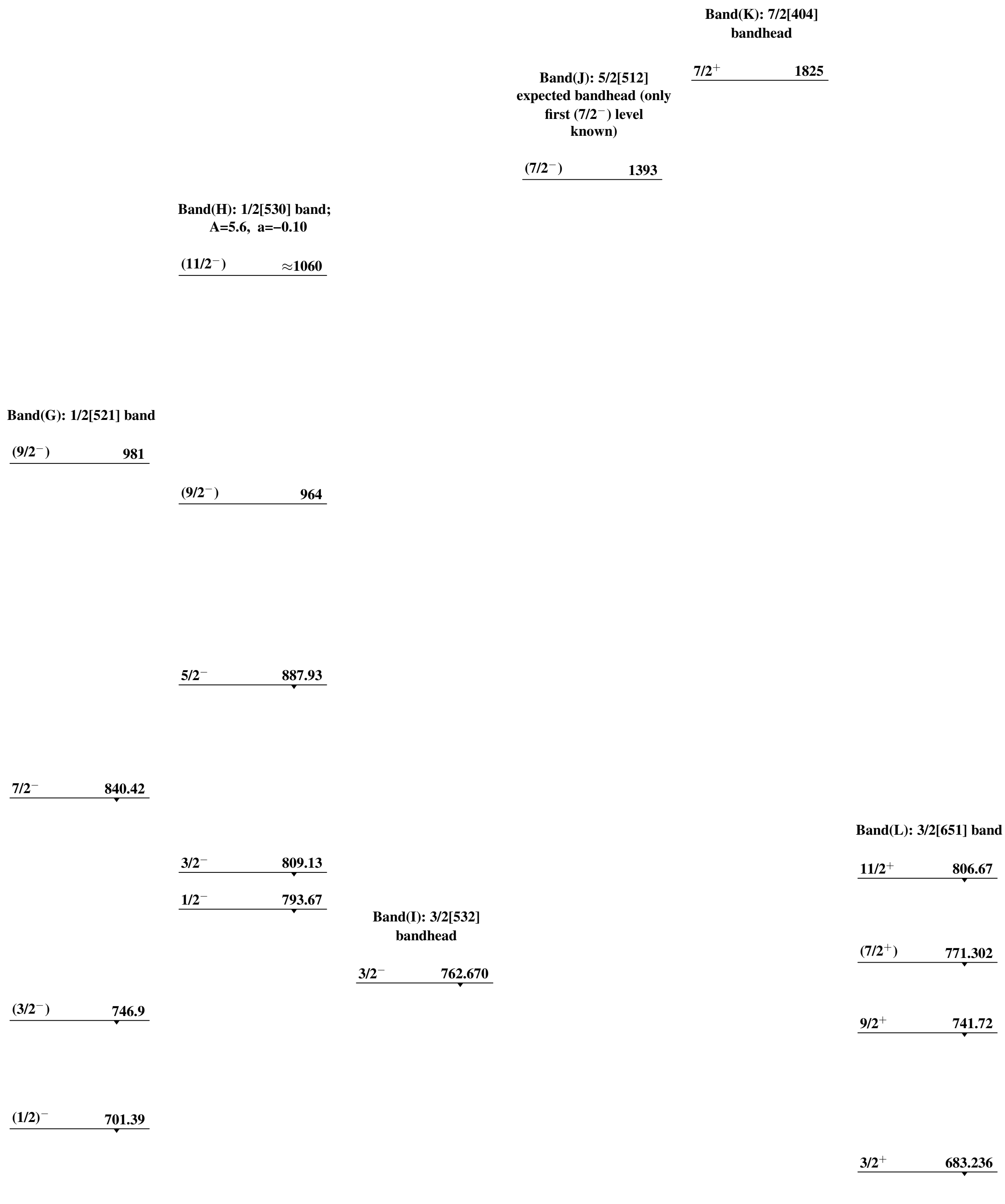
$^{157}_{64}Gd_{93}$

Adopted Levels, Gammas



$^{157}_{64}Gd_{93}$

Adopted Levels, Gammas (continued)



$^{157}_{64}Gd_{93}$