^{153}Eu(2n,γ) 1986Pr03

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

Additional information 1.

E(n)=thermal. Carried out double-neutron-capture studies on Eu_2O_3 targets containing 99.1% ^{153}Eu and 0.8% ^{151}Eu. Measured γ-ray spectrum of ^{155}Eu from 30 keV to 1.7 MeV using the curved-crystal spectrometers GAMS 1 and GAMS 2/3 and from 6.0 to 8.5 MeV using a pair spectrometer. Measured conversion-electron spectrum using the magnetic β spectrometer BILL. Isotopic assignments of individual γ-lines were made on the basis of observed changes in intensity over a series of three successive measurements.

^{155}Eu Levels

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
0.0[a]	5/2+	817.669[d] 2	5/2−	1101.670[j] 4	3/2−
78.638[a] 1	7/2+	876.831[e] 4	(1/2)+[#]	1106.799[j] 5	(1/2)−,3/2−,5/2−
104.334[b] 1	5/2−	881.689[d] 5	7/2−	1126.26?[i] 3	(5/2+)
169.009[b] 1	7/2−	911.213[e] 4	3/2+	1132.029[f] 4	(7/2)+
179.157[a] 1	9/2+	923.148[f] 5	1/2+	1138.389 12	7/2+
245.777[c] 1	3/2+	956.350[f] 18	5/2+	1151.41[h] 4	9/2+
254.665[b] 1	9/2−	973.992[d] 5	9/2−	1193.79 3	7/2+
300.688[a] 1	11/2+	977.198[g] 15	7/2+	1230.776[k] 25	5/2+
307.383[c] 1	5/2+	979.474[h] 12	5/2+	1264.045?[j] 9	3/2−,5/2−
357.169[b] 1	11/2−	1007.309[f] 6	3/2+	1301.59 5	5/2,7/2+
391.484[c] 1	7/2+	1007.988[@] 10	5/2−,7/2−	1315.94[k] 6	5/2−,7/2,9/2−
443.026[a] 8	13/2+	1053.631[e] 7	7/2+	1483.04[l] 8	3/2+
487.088[b] 1	13/2−	1054.838[h] 19	7/2+	1548.58[l] 18	(5/2+)
501.006[c] 1	9/2+	1064.663[i] 16	(3/2)+	1632.56[l] 17	7/2+
627.298[c] 1	11/2+	1068.891[e] 6	5/2+	8151.4[&] 4	
768.428[d] 3	3/2−	1078.064?[d] 14	(11/2−)		
781.993[c] 4	13/2+	1096.18 6	(3/2+,5/2+)		

[†] Computed from a least-squares fit to the listed γ-ray energies. These values differ from those given by 1986Pr03, partly because of the removal of the 481.564 γ from the level scheme. The uncertainties of 1986Pr03 are generally somewhat larger than those quoted here. The reasons for this are not clear but may be related to the existence of a systematic component in the uncertainty in the γ-ray energies, which was not included in the reported values. The level energies are rounded to the nearest 1 eV, even though in some cases the computed values are more precise than this.

[‡] From Adopted Values.

[#] Proposed as the bandhead of 1/2[411] by 1986Pr03, primarily on the basis of the expected rotational-band structure.

[@] Possible bandhead of the 7/2[523] band.

[&] Neutron-capture "state". The listed value represents the neutron binding energy.

[a] Band(A): 5/2[413] band member.

[b] Band(B): 5/2[532] band member.

[c] Band(C): 3/2[411] band member.

[d] Band(D): Probable $K^\pi=0^-$ octupole vibration built on 3/2[411]. 1986Pr03 assign this as 3/2[541], but the evaluator has not adopted this assignment. For a discussion, see the comment on this band in the Adopted Levels.

[e] Band(E): 1/2[411] band member.

[f] Band(F): 1/2[420] band member.

[g] Band(G): 7/2[404] band member.

[h] Band(H): β^-vibration built on 5/2[413].

Continued on next page (footnotes at end of table)

^{153}Eu(2n,γ) 1986Pr03 (continued)

^{155}Eu Levels (continued)

[i] Band(I): β^- vibration built on 3/2[411].
[j] Band(J): 1/2[550] band member.
[k] Band(K): 5/2[402] band member.
[l] Band(L): 3/2[422] band member ?

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu)

Iγ normalization: The individual measured Iγ values were normalized relative to the total (γ+ce) feeding of the ^{155}Eu g.s., this latter value being determined assuming (by 1986Pr03) that only 90% of this feeding takes place through the observed transitions.
α(K)exp values listed in the table are from 1986Pr03 unless noted otherwise.

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[l]	Comments
[x]30.6328[d] *3*	61.[d] *5*								
[x]39.7475 *22*	8.6[e] *22*								
[x]42.2902 *13*	1.02 *18*					(M1)		3.51	α(L)=2.75 *4*; α(M)=0.595 *9* α(N)=0.1362 *19*; α(O)=0.0216 *3*; α(P)=0.00211 *3* α(K)exp=4.2 *9*.
[x]42.3229 *16*	0.88 *18*								
[x]42.994 *3*	2.7 *4*								
61.6069 *3*	20.5 *10*	307.383	5/2$^+$	245.777	3/2$^+$	M1(+E2)	0.050 *26*	7.49	α(K)=6.30 *9*; α(L)=0.93 *3*; α(M)=0.202 *7* α(N)=0.0462 *16*; α(O)=0.00729 *22*; α(P)=0.000701 *10* α(K)exp=0.93 *8* (value seems wrongfully associated to this transition). L1/L1=1.00 *8*, L2/L1=0.098 *11*, M1/L1=0.174 *43*. δ: 0.06 *+2−6* (1986Pr03).
64.6761 *6*	9.4 *10*	169.009	7/2$^-$	104.334	5/2$^-$	M1+E2	0.11 *+5−9*	6.56 *13*	α(K)=5.45 *9*; α(L)=0.87 *9*; α(M)=0.190 *21* α(N)=0.043 *5*; α(O)=0.0067 *6*; α(P)=0.000605 *10* α(K)exp=0.85 *10* (value seems wrongfully associated to this transition). L1/L1=1.00 *5*, L2/L1=0.154 *51*, L3/L1=0.077 *38*, M1/L1=0.187 *8*, N1/K=0.062 *8*. δ: 0.12 *+3−4* (1986Pr03).
[x]69.2556 *13*	0.88 *18*								
75.5091 *5*	1.92 *16*	254.665	9/2$^-$	179.157	9/2$^+$				
[x]77.7818 *16*	0.84 *12*								
78.6379 *10*	36.0 *12*	78.638	7/2$^+$	0.0	5/2$^+$	M1+E2	0.641 *+29−28*	4.34 *8*	α(K)=2.83 *5*; α(L)=1.17 *5*; α(M)=0.269 *12* α(N)=0.060 *3*; α(O)=0.0085 *4*; α(P)=0.000290 *6* Additional information 2. α(K)exp=3.5 *2*, K/K=1.00 *3*, L1/K=0.148 *10*, L2/K=0.145 *5*, L3/K=0.150 *5*, M1/K=0.020 *1*, M2/K=0.044 *5*, M3/K=0.032 *2*, M1/K=0.020 *1*, N1/K=0.011 *1*. δ: 0.639 *16* (1986Pr03).
84.1017 *10*	20.2 *8*	391.484	7/2$^+$	307.383	5/2$^+$	M1+E2	0.113 *+25−31*	3.06	α(K)=2.56 *4*; α(L)=0.391 *13*; α(M)=0.085 *3* α(N)=0.0194 *7*; α(O)=0.00304 *9*; α(P)=0.000282 *4* α(K)exp=2.8 *2*, K/K=1.00 *3*, L1/K=0.152 *7*, L2/K=0.015 *1*, L3/K=0.011 *3*, M1/K=0.026 *3*, N1/K=0.0051 *7*. δ: 0.115 *14* (1986Pr03).
85.6568 *4*	9.8 *6*	254.665	9/2$^-$	169.009	7/2$^-$	M1+E2	0.162 *+30−36*	2.92 *5*	α(K)=2.42 *4*; α(L)=0.391 *17*; α(M)=0.085 *4*

$^{155}_{63}Eu_{92}$-3

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[l]	Comments
									α(N)=0.0195 *9*; α(O)=0.00302 *12*; α(P)=0.000266 *4* α(K)exp=2.9 *2*, K/K=1.00 *4*, L1/K=0.088 *5*, L2/K=0.026 *3*, L3/K=0.009 *2*, M1/K=0.029 *6*, N1/K=0.0088 *15*. δ: 0.184 *17* (1986Pr03).
90.3725 *17*	16.0 *6*	169.009	7/2$^-$	78.638	7/2$^+$	E1		0.373	α(K)=0.313 *5*; α(L)=0.0472 *7*; α(M)=0.01018 *15* α(N)=0.00229 *4*; α(O)=0.000342 *5*; α(P)=2.57×10^{-5} *4* α(K)exp=0.34 *3*.
[x]91.0880 *22*	0.41 *8*								
[x]97.9878 *13*	1.27 *14*					M1,E2		2.3[j] *4*	α(K)=1.45 *21*; α(L)=0.65 *42*; α(M)=0.150 *99* α(N)=0.033 *22*; α(O)=0.0047 *28*; α(P)=1.37×10^{-4} *46* α(K)exp=1.4 *3*.
[x]98.1626 *24*	0.31 *10*								
[x]99.7855[d] *20*	0.33[d] *10*								
100.5181 *11*	15.5 *4*	179.157	9/2$^+$	78.638	7/2$^+$	M1+E2	0.513 *25*	1.94	α(K)=1.459 *22*; α(L)=0.371 *13*; α(M)=0.084 *3* α(N)=0.0188 *7*; α(O)=0.00275 *9*; α(P)=0.000153 *3* α(K)exp=1.5 *2*, K/K=1.00 *9*, L1/K=0.11 *2*, L2/K=0.063 *11*, L3/K=0.065 *2*, M1/K=0.026 *1*, M2/K=0.0143 *9*, M3/K=0.0134 *27*. δ: 0.53 *3* (1986Pr03).
102.5070 *7*	5.73 *20*	357.169	11/2$^-$	254.665	9/2$^-$	M1(+E2)	0.00 *14*	1.72 *3*	α(K)=1.454 *22*; α(L)=0.208 *13*; α(M)=0.045 *3* α(N)=0.0103 *7*; α(O)=0.00163 *9*; α(P)=0.000161 *3* α(K)exp=1.5 *2*, K/K=1.00 *3*, L1/K=0.148 *10*, L2/K=0.145 *5*, L3/K=0.150 *5*, M1/K=0.020 *1*, M2/K=0.044 *5*, M3/K=0.032 *2*, N1/K=0.011 *1*. δ: 0.115 *+17−20* (1986Pr03).
104.3346 *8*	244. *20*	104.334	5/2$^-$	0.0	5/2$^+$	E1		0.253	α(K)=0.213 *3*; α(L)=0.0315 *5*; α(M)=0.00679 *10* α(N)=0.001529 *22*; α(O)=0.000230 *4*; α(P)=1.79×10^{-5} *3* α(K)exp=0.28 *3*.
[x]106.0845 *14*	0.63 *6*								
109.5219 *3*	12.3 *6*	501.006	9/2$^+$	391.484	7/2$^+$	M1(+E2)	0.08 *6*	1.425 *21*	α(K)=1.202 *18*; α(L)=0.175 *7*; α(M)=0.0379 *16* α(N)=0.0087 *4*; α(O)=0.00137 *5*; α(P)=0.0001328 *21* α(K)exp=1.10 *8*, K/K=1.00 *5*, L1/K=0.130 *6*, L2/K=0.0121 *15*, M1/K=0.0121 *3*. δ: 0.08 *+4−8* (1986Pr03).
121.5304 *8*	3.5 *4*	300.688	11/2$^+$	179.157	9/2$^+$	M1+E2	0.56 *6*	1.092 *17*	α(K)=0.844 *15*; α(L)=0.193 *11*; α(M)=0.043 *3* α(N)=0.0098 *6*; α(O)=0.00145 *8*; α(P)=8.78×10^{-5} *22* α(K)exp=0.82 *8*, K/K=1.00 *9*, L1/K=0.100 *5*, L2/K=0.048 *6*, L3/K=0.054 *6*, M1/K=0.026 *4*. δ: 0.62 *5* (1986Pr03).
[x]125.944 *3*	0.49 *16*					M1		0.956	α(K)=0.809 *12*; α(L)=0.1154 *17*; α(M)=0.0249 *4* α(N)=0.00571 *8*; α(O)=0.000906 *13*; α(P)=8.95×10^{-5} *13* α(K)exp=1.4 *5*.
126.2917 *10*	3.3 *6*	627.298	11/2$^+$	501.006	9/2$^+$	M1		0.949	α(K)=0.803 *12*; α(L)=0.1145 *16*; α(M)=0.0247 *4* α(N)=0.00567 *8*; α(O)=0.000899 *13*; α(P)=8.88×10^{-5} *13* α(K)exp=0.93 *20*.

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γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
129.9192 *8*	1.76 *10*	487.088	13/2$^-$	357.169	11/2$^-$	M1	0.876	α(K)=0.741 *11*; α(L)=0.1057 *15*; α(M)=0.0228 *4* α(N)=0.00523 *8*; α(O)=0.000829 *12*; α(P)=8.19×10^{-5} *12* α(K)exp=0.75 *9*.
136.8172 *11*	4.1 *3*	391.484	7/2$^+$	254.665	9/2$^-$	E1	0.1215	α(K)=0.1027 *15*; α(L)=0.01479 *21*; α(M)=0.00318 *5* α(N)=0.000718 *10*; α(O)=0.0001093 *16*; α(P)=8.94×10^{-6} *13* α(K)exp=0.10 *1*.
138.3746 *5*	8.00 *25*	307.383	5/2$^+$	169.009	7/2$^-$	E1	0.1178	α(K)=0.0996 *14*; α(L)=0.01433 *20*; α(M)=0.00308 *5* α(N)=0.000696 *10*; α(O)=0.0001060 *15*; α(P)=8.69×10^{-6} *13* α(K)exp=0.10 *1*.
140.204 *9*	0.31 *10*	627.298	11/2$^+$	487.088	13/2$^-$			
[x]140.995 *6*	0.5 *3*							
141.4428 *6*	95 *5*	245.777	3/2$^+$	104.334	5/2$^-$	E1	0.1110	α(K)=0.0939 *14*; α(L)=0.01348 *19*; α(M)=0.00290 *4* α(N)=0.000655 *10*; α(O)=9.98×10^{-5} *14*; α(P)=8.21×10^{-6} *12* α(K)exp=0.090 *9*.
142.814 *4*	0.90 *10*	911.213	3/2$^+$	768.428	3/2$^-$			
143.8349 *18*	1.60 *10*	501.006	9/2$^+$	357.169	11/2$^-$			
145.7083 *21*	3.07 *12*	391.484	7/2$^+$	245.777	3/2$^+$	E2	0.635	α(K)=0.399 *6*; α(L)=0.183 *3*; α(M)=0.0422 *6* α(N)=0.00940 *14*; α(O)=0.001306 *19*; α(P)=3.17×10^{-5} *5* α(K)exp=0.36 *4*.
150.3292 *12*	1.12 *12*	254.665	9/2$^-$	104.334	5/2$^-$	E2	0.569	α(K)=0.364 *5*; α(L)=0.1597 *23*; α(M)=0.0369 *6* α(N)=0.00822 *12*; α(O)=0.001145 *16*; α(P)=2.91×10^{-5} *4* α(K)exp=0.31 *5*.
154.6976[mn] *36*	0.74[m] *18*	923.148	1/2$^+$	768.428	3/2$^-$			
154.698[m] *4*	0.74[m] *18*	781.993	13/2$^+$	627.298	11/2$^+$	M1	0.536	α(K)=0.454 *7*; α(L)=0.0645 *9*; α(M)=0.01394 *20* α(N)=0.00319 *5*; α(O)=0.000506 *7*; α(P)=5.01×10^{-5} *7* α(K)exp=0.59 *16* (contaminated by 154.fγ from 923 level).
[x]157.696[h] *13*	<0.3					(M1)	0.508	α(K)=0.430 *6*; α(L)=0.0611 *9*; α(M)=0.01320 *19* α(N)=0.00302 *5*; α(O)=0.000480 *7*; α(P)=4.75×10^{-5} *7*
[x]164.263 *5*	0.31 *8*							
[x]164.656 *4*	0.45 *8*					E2	0.416	α(K)=0.276 *4*; α(L)=0.1086 *16*; α(M)=0.0250 *4* α(N)=0.00558 *8*; α(O)=0.000782 *11*; α(P)=2.26×10^{-5} *4* α(K)exp=0.20 *7*.
[x]165.360 *7*	0.31 *10*							
167.1482 *11*	3.42 *25*	245.777	3/2$^+$	78.638	7/2$^+$	E2	0.395	α(K)=0.264 *4*; α(L)=0.1020 *15*; α(M)=0.0235 *4* α(N)=0.00524 *8*; α(O)=0.000735 *11*; α(P)=2.16×10^{-5} *3* α(K)exp=0.20 *3*.
169.0067 *9*	62. *4*	169.009	7/2$^-$	0.0	5/2$^+$	E1	0.0687	α(K)=0.0582 *9*; α(L)=0.00825 *12*; α(M)=0.001773 *25* α(N)=0.000401 *6*; α(O)=6.15×10^{-5} *9*; α(P)=5.21×10^{-6} *8* α(K)exp=0.052 *4*.
171.940[n] *5*	0.37 *6*	1053.631	7/2$^+$	881.689	7/2$^-$			α(K)exp=0.17 *5*. Mult.: from α data, mult=E2, but placement indicates a parity change. Note, however, that the placement is questionable.

$^{155}_{63}Eu_{92}$-5

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
176.0262 *5*	34.8 *20*	254.665	9/2$^-$	78.638	7/2$^+$	E1	0.0616	α(K)=0.0522 *8*; α(L)=0.00738 *11*; α(M)=0.001586 *23* α(N)=0.000359 *5*; α(O)=5.51×10^{-5} *8*; α(P)=4.70×10^{-6} *7* α(K)exp=0.042 *4*.
x176.650[h] *6*	<0.3					(M1)	0.370	α(K)=0.314 *5*; α(L)=0.0445 *7*; α(M)=0.00961 *14* α(N)=0.00220 *3*; α(O)=0.000349 *5*; α(P)=3.46×10^{-5} *5* α(K)exp<0.37.
x177.201 *4*	0.37 *6*					M1,E2	0.345[j] *23*	α(K)=0.27 *5*; α(L)=0.062 *18*; α(M)=0.0139 *45* α(N)=0.00314 *96*; α(O)=4.6×10^{-4} *12*; α(P)=2.63×10^{-5} *80* α(K)exp=0.27 *7*.
x177.591 *11*	2.6 *6*					E1	0.0601	α(K)=0.0510 *8*; α(L)=0.00720 *10*; α(M)=0.001548 *22* α(N)=0.000351 *5*; α(O)=5.38×10^{-5} *8*; α(P)=4.59×10^{-6} *7* α(K)exp=0.06 *2*.
178.0092 *8*	10.2 *6*	357.169	11/2$^-$	179.157	9/2$^+$	E1	0.0598	α(K)=0.0507 *7*; α(L)=0.00715 *10*; α(M)=0.001538 *22* α(N)=0.000348 *5*; α(O)=5.35×10^{-5} *8*; α(P)=4.56×10^{-6} *7* α(K)exp=0.060 *5*.
178.572 *7*	1.02 *22*	1101.670	3/2$^-$	923.148	1/2$^+$	E1	0.0593	α(K)=0.0502 *7*; α(L)=0.00709 *10*; α(M)=0.001525 *22* α(N)=0.000345 *5*; α(O)=5.30×10^{-5} *8*; α(P)=4.53×10^{-6} *7* α(K)exp=0.09 *4*.
179.1570 *6*	28.6 *16*	179.157	9/2$^+$	0.0	5/2$^+$	E2	0.312	α(K)=0.213 *3*; α(L)=0.0764 *11*; α(M)=0.01754 *25* α(N)=0.00392 *6*; α(O)=0.000552 *8*; α(P)=1.780×10^{-5} *25* α(K)exp=0.172 *15*.
186.3955 *25*	1.74 *16*	487.088	13/2$^-$	300.688	11/2$^+$	E1	0.0529	α(K)=0.0448 *7*; α(L)=0.00631 *9*; α(M)=0.001356 *19* α(N)=0.000307 *5*; α(O)=4.72×10^{-5} *7*; α(P)=4.06×10^{-6} *6* α(K)exp=0.040 *7*.
187.241[hn] *6*	<0.3[e]	1068.891	5/2$^+$	881.689	7/2$^-$			
188.1601 *22*	1.55 *22*	357.169	11/2$^-$	169.009	7/2$^-$	E2	0.264	α(K)=0.184 *3*; α(L)=0.0625 *9*; α(M)=0.01432 *20* α(N)=0.00320 *5*; α(O)=0.000453 *7*; α(P)=1.550×10^{-5} *22* α(K)exp=0.13 *4*.
193.6233 *16*	4.5 *5*	501.006	9/2$^+$	307.383	5/2$^+$	E2	0.240	α(K)=0.1683 *24*; α(L)=0.0556 *8*; α(M)=0.01273 *18* α(N)=0.00285 *4*; α(O)=0.000404 *6*; α(P)=1.429×10^{-5} *20* α(K)exp=0.13 *2*.
195.624 *6*	6.14 *10*	1106.799	(1/2)$^-$,3/2$^-$,5/2$^-$	911.213	3/2$^+$	E1	0.0465	α(K)=0.0394 *6*; α(L)=0.00553 *8*; α(M)=0.001189 *17* α(N)=0.000270 *4*; α(O)=4.15×10^{-5} *6*; α(P)=3.59×10^{-6} *5* α(K)exp=0.05 *1*.
203.048 *3*	4.3 *5*	307.383	5/2$^+$	104.334	5/2$^-$	E1	0.0421	α(K)=0.0357 *5*; α(L)=0.00500 *7*; α(M)=0.001075 *15* α(N)=0.000244 *4*; α(O)=3.76×10^{-5} *6*; α(P)=3.27×10^{-6} *5* α(K)exp=0.032 *4*.
x205.6123 *21*	2.0 *3*							α(K)exp=0.088 *25*.
212.284[n] *3*	5.1 *5*	391.484	7/2$^+$	179.157	9/2$^+$			α(K)exp=0.039 *6*. Mult.: from α data, mult=E1, but placement indicates no parity change. Note that the γ is questionably placed.
222.046 *4*	18 *3*	300.688	11/2$^+$	78.638	7/2$^+$	E2	0.1522	α(K)=0.1108 *16*; α(L)=0.0322 *5*; α(M)=0.00733 *11*

$^{155}_{63}Eu_{92}$-6

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[l]	Comments
									α(N)=0.001641 *23*; α(O)=0.000235 *4*; α(P)=9.70×10^{-6} *14* α(K)exp=0.076 *13*.
222.4732 *24*	3.1 *5*	391.484	7/2$^+$	169.009	7/2$^-$	E1		0.0331	α(K)=0.0281 *4*; α(L)=0.00391 *6*; α(M)=0.000841 *12* α(N)=0.000191 *3*; α(O)=2.95×10^{-5} *5*; α(P)=2.59×10^{-6} *4* α(K)exp=0.036 *8*.
224.8323 *25*	1.64 *20*	1101.670	3/2$^-$	876.831	(1/2)$^+$	E1		0.0322	α(K)=0.0273 *4*; α(L)=0.00381 *6*; α(M)=0.000818 *12* α(N)=0.000185 *3*; α(O)=2.87×10^{-5} *4*; α(P)=2.53×10^{-6} *4* α(K)exp=0.027 *8*.
[x]226.223 *12*	1.70 *25*					E1		0.0317	α(K)=0.0269 *4*; α(L)=0.00374 *6*; α(M)=0.000804 *12* α(N)=0.000182 *3*; α(O)=2.82×10^{-5} *4*; α(P)=2.49×10^{-6} *4* α(K)exp=0.026 *9*.
228.7346 *18*	4.8 *4*	307.383	5/2$^+$	78.638	7/2$^+$	M1+E2	1.0 *+4−3*	0.160 *8*	α(K)=0.128 *10*; α(L)=0.0252 *13*; α(M)=0.0056 *4* α(N)=0.00127 *7*; α(O)=0.000190 *8*; α(P)=1.30×10^{-5} *14* α(K)exp=0.13 *1*. δ: computed by the evaluator from α(K)exp=0.13 *1*.
229.943 *5*	1.43 *25*	1106.799	(1/2)$^-$,3/2$^-$,5/2$^-$	876.831	(1/2)$^+$				
232.466 *13*	1.23 *20*	487.088	13/2$^-$	254.665	9/2$^-$	E2		0.1310	α(K)=0.0964 *14*; α(L)=0.0269 *4*; α(M)=0.00612 *9* α(N)=0.001371 *20*; α(O)=0.000197 *3*; α(P)=8.52×10^{-6} *12* α(K)exp=0.75 *9*. Mult.: from α data, mult=E2+M1, with δ>0.5 is deduced. From level scheme, M1 is not allowed.
[x]237.004[c] *4*	1.0[c] *4*					M1,E2		0.144[j] *22*	α(K)=0.116 *25*; α(L)=0.022 *3*; α(M)=0.0050 *7* α(N)=0.00112 *15*; α(O)=0.000169 *15*; α(P)=1.18×10^{-5} *37* α(K)exp=0.19 *10*.
[x]240.9543 *19*	5.1 *5*					E1		0.0269	α(K)=0.0228 *4*; α(L)=0.00317 *5*; α(M)=0.000680 *10* α(N)=0.0001543 *22*; α(O)=2.39×10^{-5} *4*; α(P)=2.12×10^{-6} *3* α(K)exp=0.015 *3*.
[x]241.834 *8*	1.94 *18*					E2		0.1152	α(K)=0.0855 *12*; α(L)=0.0231 *4*; α(M)=0.00524 *8* α(N)=0.001176 *17*; α(O)=0.0001696 *24*; α(P)=7.62×10^{-6} *11* α(K)exp=0.082 *16*.
[x]243.665 *11*	1.53 *14*					E2		0.1124	α(K)=0.0836 *12*; α(L)=0.0225 *4*; α(M)=0.00509 *8* α(N)=0.001142 *16*; α(O)=0.0001648 *23*; α(P)=7.46×10^{-6} *11* α(K)exp=0.10 *3*.

$^{155}_{63}Eu_{92}$-7

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[l]	Comments
245.771 *4*	168 *11*	245.777	3/2$^+$	0.0	5/2$^+$	M1+E2	0.34 *+5−6*	0.1458 *24*	α(K)=0.1225 *23*; α(L)=0.0183 *3*; α(M)=0.00397 *7* α(N)=0.000907 *15*; α(O)=0.0001425 *21*; α(P)=1.33×10^{-5} *3* α(K)exp=0.10 , K/K=1.00 *5*, L1/K=0.146 *8*, L2/K=0.0183 *12*, L3/K=0.0045 *7*, M1/K=0.033 *2*, M2/K=0.0055 *7*, N1/K=0.0090 *7*. δ: 0.31 *2* (1986Pr03).
256.737 *7*	1.12 *12*	1264.045?	3/2$^-$,5/2$^-$	1007.309	3/2$^+$	E1		0.0228	α(K)=0.0194 *3*; α(L)=0.00268 *4*; α(M)=0.000575 *8* α(N)=0.0001306 *19*; α(O)=2.03×10^{-5} *3*; α(P)=1.81×10^{-6} *3* α(K)exp=0.024 *4*.
263.869 *8*	5.1 *3*	443.026	13/2$^+$	179.157	9/2$^+$	E2		0.0871	α(K)=0.0658 *10*; α(L)=0.01660 *24*; α(M)=0.00375 *6* α(N)=0.000842 *12*; α(O)=0.0001224 *18*; α(P)=5.97×10^{-6} *9* α(K)exp=0.060 *7*.
[x]268.803 *14*	0.78 *10*					M1		0.1179	α(K)=0.1000 *14*; α(L)=0.01403 *20*; α(M)=0.00303 *5* α(N)=0.000693 *10*; α(O)=0.0001101 *16*; α(P)=1.098×10^{-5} *16* α(K)exp=0.17 *4*.
[x]269.245 *6*	1.10 *12*					E2		0.0817	α(K)=0.0619 *9*; α(L)=0.01540 *22*; α(M)=0.00348 *5* α(N)=0.000781 *11*; α(O)=0.0001136 *16*; α(P)=5.64×10^{-6} *8* α(K)exp=0.057 *13*.
[x]277.027 *14*	1.31 *14*					M1		0.1088	α(K)=0.0923 *13*; α(L)=0.01294 *19*; α(M)=0.00279 *4* α(N)=0.000639 *9*; α(O)=0.0001015 *15*; α(P)=1.012×10^{-5} *15* α(K)exp=0.12 *2*.
280.940 *13*	0.8 *3*	781.993	13/2$^+$	501.006	9/2$^+$	(E2)		0.0714	α(K)=0.0545 *8*; α(L)=0.01315 *19*; α(M)=0.00296 *5* α(N)=0.000666 *10*; α(O)=9.72×10^{-5} *14*; α(P)=5.01×10^{-6} *7* α(K)exp=0.075 *28*. Mult.: 1986Pr03 list mult=M1,E2, but placement eliminates M1.
[x]281.867 *5*	5.3 *4*					E1		0.0179	α(K)=0.01526 *22*; α(L)=0.00210 *3*; α(M)=0.000451 *7* α(N)=0.0001024 *15*; α(O)=1.592×10^{-5} *23*; α(P)=1.441×10^{-6} *21* α(K)exp=0.017 *3*.
[x]285.253 *6*	3.1 *4*					(E2)		0.0681	α(K)=0.0521 *8*; α(L)=0.01244 *18*; α(M)=0.00280 *4* α(N)=0.000630 *9*; α(O)=9.20×10^{-5} *13*; α(P)=4.80×10^{-6} *7* α(K)exp=0.033 *6*.
287.146 *4*	5.1 *4*	391.484	7/2$^+$	104.334	5/2$^-$	E1		0.01711	α(K)=0.01456 *21*; α(L)=0.00200 *3*; α(M)=0.000430 *6* α(N)=9.76×10^{-5} *14*; α(O)=1.518×10^{-5} *22*; α(P)=1.377×10^{-6} *20* α(K)exp=0.014 *3*.
[x]295.260 *12*	2.05 *20*					E2		0.0612	α(K)=0.0471 *7*; α(L)=0.01097 *16*; α(M)=0.00247 *4* α(N)=0.000555 *8*; α(O)=8.13×10^{-5} *12*; α(P)=4.36×10^{-6} *7* α(K)exp=0.050 *2*.
307.384 *9*	1.0[e]	307.383	5/2$^+$	0.0	5/2$^+$				

$^{155}_{63}Eu_{92}$-8

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
312.929 *8*	0.47 *20*	391.484	7/2$^+$	78.638	7/2$^+$			
x315.161 *6*	1.02 *10*					M1	0.0772	α(K)=0.0655 *10*; α(L)=0.00915 *13*; α(M)=0.00197 *3* α(N)=0.000452 *7*; α(O)=7.18×10^{-5} *10*; α(P)=7.17×10^{-6} *10* α(K)exp=0.067 *12*.
x316.626[h] *13*								Ice(K)=0.041 *10*.
332.017 *4*	4.7 *4*	501.006	9/2$^+$	169.009	7/2$^-$	E1	0.01189	α(K)=0.01013 *15*; α(L)=0.001382 *20*; α(M)=0.000297 *5* α(N)=6.75×10^{-5} *10*; α(O)=1.052×10^{-5} *15*; α(P)=9.69×10^{-7} *14* α(K)exp=0.010 *3*.
x333.731 *4*	0.72 *10*							
x338.114 *14*	2.5 *4*					E1	0.01137	α(K)=0.00969 *14*; α(L)=0.001320 *19*; α(M)=0.000283 *4* α(N)=6.45×10^{-5} *9*; α(O)=1.006×10^{-5} *14*; α(P)=9.28×10^{-7} *13* α(K)exp=<0.012.
x346.073 *14*	0.41 *16*							
346.705 *6*	1.45 *10*	973.992	9/2$^-$	627.298	11/2$^+$	[E1]	0.01069	α(K)=0.00911 *13*; α(L)=0.001240 *18*; α(M)=0.000266 *4* α(N)=6.05×10^{-5} *9*; α(O)=9.45×10^{-6} *14*; α(P)=8.74×10^{-7} *13*
x354.906 *3*	4.8 *3*					E1	0.01009	α(K)=0.00861 *12*; α(L)=0.001170 *17*; α(M)=0.000251 *4* α(N)=5.71×10^{-5} *8*; α(O)=8.92×10^{-6} *13*; α(P)=8.27×10^{-7} *12* α(K)exp=0.017 *3*.
x360.97 *3*	0.20 *6*							
x366.316 *8*	0.82 *10*							
x370.672[d] *11*	1.02[d] *10*							
x371.44 *2*	0.51 *10*							
372.667 *7*	8.2 *8*	627.298	11/2$^+$	254.665	9/2$^-$	E1	0.00896	α(K)=0.00765 *11*; α(L)=0.001037 *15*; α(M)=0.000222 *4* α(N)=5.06×10^{-5} *7*; α(O)=7.91×10^{-6} *11*; α(P)=7.37×10^{-7} *11* α(K)exp=0.011 *2*.
x375.064 *13*	0.80 *12*					(E2)	0.0298	α(K)=0.0237 *4*; α(L)=0.00476 *7*; α(M)=0.001060 *15* α(N)=0.000239 *4*; α(O)=3.57×10^{-5} *5*; α(P)=2.28×10^{-6} *4* α(K)exp=0.025 *13*.
380.670 *8*	5.9 *6*	881.689	7/2$^-$	501.006	9/2$^+$	E1	0.00852	α(K)=0.00727 *11*; α(L)=0.000984 *14*; α(M)=0.000211 *3* α(N)=4.81×10^{-5} *7*; α(O)=7.52×10^{-6} *11*; α(P)=7.01×10^{-7} *10* α(K)exp=0.005 *2*.
x385.881 *14*	0.92 *10*					E2	0.0274	α(K)=0.0219 *3*; α(L)=0.00433 *6*; α(M)=0.000963 *14* α(N)=0.000218 *3*; α(O)=3.25×10^{-5} *5*; α(P)=2.11×10^{-6} *3* α(K)exp=0.022 *11*.
391.34 *3*	0.72 *14*	391.484	7/2$^+$	0.0	5/2$^+$			
x392.75 *3*	0.20 *4*							
x393.105 *16*	0.63 *8*					E2,M1	0.035[j] *9*	α(K)=0.0288 *80*; α(L)=0.0046 *6*; α(M)=0.00100 *10* α(N)=0.000228 *24*; α(O)=3.5×10^{-5} *5*; α(P)=3.0×10^{-6} *10* α(K)exp=0.025 *13*.
x394.795 *14*	0.72 *10*					E2,M1	0.0342[j] *86*	α(K)=0.0284 *80*; α(L)=0.0045 *6*; α(M)=0.00099 *10* α(N)=0.000225 *24*; α(O)=3.5×10^{-5} *5*; α(P)=2.98×10^{-6} *99* α(K)exp=0.025 *12*.

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

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
[x]400.240 *5*	2.56 *25*					E1	0.00755	α(K)=0.00645 *9*; α(L)=0.000871 *13*; α(M)=0.000187 *3* α(N)=4.25×10^{-5} *6*; α(O)=6.66×10^{-6} *10*; α(P)=6.24×10^{-7} *9* α(K)exp=0.008 *3*.
[x]402.932 *8*	2.05 *20*					E2	0.0242	α(K)=0.0194 *3*; α(L)=0.00376 *6*; α(M)=0.000834 *12* α(N)=0.000189 *3*; α(O)=2.83×10^{-5} *4*; α(P)=1.89×10^{-6} *3* α(K)exp=0.015 *5*.
[x]405.973 *4*	3.9 *4*					E1	0.00730	α(K)=0.00623 *9*; α(L)=0.000842 *12*; α(M)=0.000181 *3* α(N)=4.11×10^{-5} *6*; α(O)=6.44×10^{-6} *9*; α(P)=6.04×10^{-7} *9* α(K)exp=0.009 *4*.
[x]408.195 *14*	0.72 *12*					M1,E2	0.0313[j] *80*	α(K)=0.0260 *74*; α(L)=0.0041 *6*; α(M)=0.00090 *10* α(N)=0.000204 *24*; α(O)=3.2×10^{-5} *5*; α(P)=2.73×10^{-6} *91* α(K)exp=0.037 *18*.
[x]410.126 *13*	0.92 *12*					M1,E2	0.0309[j] *79*	α(K)=0.0257 *73*; α(L)=0.0041 *6*; α(M)=0.00089 *10* α(N)=0.000202 *24*; α(O)=3.1×10^{-5} *5*; α(P)=2.70×10^{-6} *90* α(K)exp=0.021 *9*.
[x]418.429 *24*	2.0 *3*					E1	0.00680	α(K)=0.00580 *9*; α(L)=0.000783 *11*; α(M)=0.0001678 *24* α(N)=3.82×10^{-5} *6*; α(O)=5.99×10^{-6} *9*; α(P)=5.64×10^{-7} *8* α(K)exp<0.01.
[x]420.842 *18*	1.02 *16*							
422.078 *13*	1.06 *16*	501.006	9/2$^+$	78.638	7/2$^+$	M1	0.0360	α(K)=0.0306 *5*; α(L)=0.00423 *6*; α(M)=0.000912 *13* α(N)=0.000209 *3*; α(O)=3.32×10^{-5} *5*; α(P)=3.33×10^{-6} *5* α(K)exp=0.035 *8*.
424.844 *18*	0.67 *14*	781.993	13/2$^+$	357.169	11/2$^-$			
426.177 *3*	7.8 *6*	817.669	5/2$^-$	391.484	7/2$^+$	E1	0.00651	α(K)=0.00556 *8*; α(L)=0.000749 *11*; α(M)=0.0001606 *23* α(N)=3.66×10^{-5} *6*; α(O)=5.73×10^{-6} *8*; α(P)=5.41×10^{-7} *8* α(K)exp=0.005 *1*.
[x]428.312 *24*	1.43 *14*							
[x]432.422 *15*	1.23 *12*							
[x]434.456 *19*	2.86 *25*					E1	0.00623	α(K)=0.00532 *8*; α(L)=0.000716 *10*; α(M)=0.0001534 *22* α(N)=3.49×10^{-5} *5*; α(O)=5.48×10^{-6} *8*; α(P)=5.17×10^{-7} *8* α(K)exp=0.012.
[x]436.438 *24*	0.61 *10*							
[x]437.471 *15*	1.2 *4*							
[x]439.278 *22*	0.61 *10*							
448.3[n] *2*	0.4 *2*	627.298	11/2$^+$	179.157	9/2$^+$			
[x]448.848 *11*	1.19 *14*							
[x]458.614 *12*	1.02 *10*							
461.046 *11*	7.6 *8*	768.428	3/2$^-$	307.383	5/2$^+$	E1	0.00543	α(K)=0.00463 *7*; α(L)=0.000622 *9*; α(M)=0.0001333 *19* α(N)=3.04×10^{-5} *5*; α(O)=4.77×10^{-6} *7*; α(P)=4.52×10^{-7} *7* α(K)exp=0.0038 *12*.
[x]464.64 *3*	0.72 *10*							
[x]467.30 *4*	0.61 *12*							
[x]470.06 *4*	0.51 *10*							

$^{155}_{63}Eu_{92}$-10

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
472.841[g] *17*	2.9[g] *4*	973.992	9/2⁻	501.006	9/2⁺	E1	0.00512	α(K)=0.00437 *7*; α(L)=0.000586 *9*; α(M)=0.0001257 *18* α(N)=2.86×10^{-5} *4*; α(O)=4.50×10^{-6} *7*; α(P)=4.28×10^{-7} *6* α(K)exp<0.005.
[x]481.546 *13*	1.6 *3*					M1	0.0257	α(K)=0.0219 *3*; α(L)=0.00301 *5*; α(M)=0.000648 *9* α(N)=0.0001484 *21*; α(O)=2.36×10^{-5} *4*; α(P)=2.37×10^{-6} *4* α(K)exp=0.023 *6*. E_γ: placed from the 782, 13/2⁺ level by 1986Pr03. However, this placement is not adopted by the evaluator because: (1) in (^{7}Li,α2nγ), 1998Ha27 do not report this γ, even though, according to 1986Pr03, it would be the strongest decay mode of this level; (2) the energy fit is poor; and (3) if all the intensity of this γ proceeds from this level, the evaluator computes a B(M1) value for it that is ≈50 times larger than that for the 422.08 γ, which is the corresponding transition connecting the 3/2[411] and 5/2[413] bands from the 501, 9/2⁺ level.
[x]487.698 *16*	1.29 *14*							
490.327 *15*	2.4 *3*	881.689	7/2⁻	391.484	7/2⁺	E1	0.00471	α(K)=0.00403 *6*; α(L)=0.000539 *8*; α(M)=0.0001155 *17* α(N)=2.63×10^{-5} *4*; α(O)=4.13×10^{-6} *6*; α(P)=3.94×10^{-7} *6* α(K)exp<0.006.
[x]492.27 *4*	0.72 *14*							
[x]496.473 *18*	1.53 *16*							
[x]501.764 *16*	1.12 *16*					M1	0.0231	α(K)=0.0197 *3*; α(L)=0.00271 *4*; α(M)=0.000583 *9* α(N)=0.0001335 *19*; α(O)=2.12×10^{-5} *3*; α(P)=2.14×10^{-6} *3* α(K)exp=0.024 *8*.
[x]502.569 *6*	2.5 *4*					E2	0.01320	α(K)=0.01079 *16*; α(L)=0.00189 *3*; α(M)=0.000415 *6* α(N)=9.41×10^{-5} *14*; α(O)=1.432×10^{-5} *20*; α(P)=1.075×10^{-6} *15* α(K)exp=0.014 *4*.
[x]503.107 *13*	1.12 *18*							
[x]509.154 *18*	1.8 *4*					(E1)	0.00433	α(K)=0.00370 *6*; α(L)=0.000494 *7*; α(M)=0.0001059 *15* α(N)=2.41×10^{-5} *4*; α(O)=3.79×10^{-6} *6*; α(P)=3.63×10^{-7} *5* α(K)exp<0.008.
510.296 *3*	10.0 *8*	817.669	5/2⁻	307.383	5/2⁺	E1	0.00431	α(K)=0.00368 *6*; α(L)=0.000492 *7*; α(M)=0.0001054 *15* α(N)=2.40×10^{-5} *4*; α(O)=3.77×10^{-6} *6*; α(P)=3.61×10^{-7} *5* α(K)exp=0.005 *1*.
[x]511.220 *18*	1.43 *16*							
[x]512.586 *13*	2.45 *20*					M1	0.0219	α(K)=0.0187 *3*; α(L)=0.00256 *4*; α(M)=0.000552 *8* α(N)=0.0001264 *18*; α(O)=2.01×10^{-5} *3*; α(P)=2.02×10^{-6} *3* α(K)exp=0.018 *4*.
[x]513.33 *6*	0.51 *12*							
[x]518.65 *4*	1.02 *14*							
522.670 *4*	14.3 *8*	768.428	3/2⁻	245.777	3/2⁺	E1	0.00408	α(K)=0.00349 *5*; α(L)=0.000466 *7*; α(M)=9.98×10^{-5} *14* α(N)=2.27×10^{-5} *4*; α(O)=3.58×10^{-6} *5*; α(P)=3.43×10^{-7} *5* α(K)exp=0.0033 *5*.
[x]526.185 *15*	1.33 *12*							
[x]529.426 *13*	8.2 *2*					M1	0.0202	α(K)=0.01719 *24*; α(L)=0.00236 *4*; α(M)=0.000508 *8*

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

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
								α(N)=0.0001163 *17*; α(O)=1.85×10^{-5} *3*; α(P)=1.86×10^{-6} *3* α(K)exp=0.018 *8*.
[x]530.667 *14*	1.02 *10*							
[x]539.692 *25*	1.43 *20*							
[x]551.235 *22*	1.33 *16*					M1	0.0182	α(K)=0.01554 *22*; α(L)=0.00213 *3*; α(M)=0.000458 *7* α(N)=0.0001049 *15*; α(O)=1.670×10^{-5} *24*; α(P)=1.684×10^{-6} *24* α(K)exp=0.022 *7*.
552.625 *10*	5.7 *4*	1053.631	7/2$^+$	501.006	9/2$^+$	M1,E2	0.0142[j] *40*	α(K)=0.0120 *35*; α(L)=0.0018 *4*; α(M)=0.00038 *8* α(N)=8.8×10^{-5} *17*; α(O)=1.4×10^{-5} *3*; α(P)=1.26×10^{-6} *41* α(K)exp=0.012 *2*.
[x]559.805 *23*	1.33 *14*							
[x]560.236 *9*	3.27 *20*					M1,E2	0.0137[j] *38*	α(K)=0.0116 *34*; α(L)=0.0017 *4*; α(M)=0.00037 *7* α(N)=8.5×10^{-5} *17*; α(O)=1.3×10^{-5} *3*; α(P)=1.22×10^{-6} *40* α(K)exp=0.011 *3*.
[x]562.027 *6*	1.12 *14*							
564.831 *22*	10.6 *8*	956.350	5/2$^+$	391.484	7/2$^+$	M1	0.01716	α(K)=0.01461 *21*; α(L)=0.00200 *3*; α(M)=0.000430 *6* α(N)=9.86×10^{-5} *14*; α(O)=1.569×10^{-5} *22*; α(P)=1.583×10^{-6} *23* α(K)exp=0.012 *2*.
571.885 *4*	8.0 *4*	817.669	5/2$^-$	245.777	3/2$^+$	E1	0.00335	α(K)=0.00286 *4*; α(L)=0.000381 *6*; α(M)=8.15×10^{-5} *12* α(N)=1.86×10^{-5} *3*; α(O)=2.93×10^{-6} *4*; α(P)=2.82×10^{-7} *4* α(K)exp=0.0031 *8*.
574.277 *9*	11.5 *12*	881.689	7/2$^-$	307.383	5/2$^+$	E1	0.00332	α(K)=0.00284 *4*; α(L)=0.000377 *6*; α(M)=8.07×10^{-5} *12* α(N)=1.84×10^{-5} *3*; α(O)=2.90×10^{-6} *4*; α(P)=2.80×10^{-7} *4* α(K)exp=0.0032 *7*.
577.107 *18*	1.23 *12*	1078.064?	(11/2$^-$)	501.006	9/2$^+$			
[x]579.911 *20*	1.64 *16*							
[x]581.834 *10*	4.5 *4*					M1,E2	0.0125[j] *35*	α(K)=0.0105 *31*; α(L)=0.0015 *4*; α(M)=0.00033 *7* α(N)=7.6×10^{-5} *15*; α(O)=1.2×10^{-5} *3*; α(P)=1.11×10^{-6} *36* α(K)exp=0.011 *2*.
582.519 *9*	7.0 *6*	973.992	9/2$^-$	391.484	7/2$^+$	E1	0.00322	α(K)=0.00275 *4*; α(L)=0.000365 *6*; α(M)=7.82×10^{-5} *11* α(N)=1.784×10^{-5} *25*; α(O)=2.81×10^{-6} *4*; α(P)=2.72×10^{-7} *4* α(K)exp=0.0026 *8*.
[x]585.816 *9*	2.7 *4*					E1	0.00318	α(K)=0.00272 *4*; α(L)=0.000361 *5*; α(M)=7.72×10^{-5} *11* α(N)=1.762×10^{-5} *25*; α(O)=2.77×10^{-6} *4*; α(P)=2.68×10^{-7} *4*
[x]587.06 *4*	0.82 *20*							
[x]590.124 *19*	0.41 *12*							
590.905 *21*	1.0 *2*	1078.064?	(11/2$^-$)	487.088	13/2$^-$			
603.806 *9*	11.7 *8*	911.213	3/2$^+$	307.383	5/2$^+$	M1	0.01452	α(K)=0.01237 *18*; α(L)=0.001690 *24*; α(M)=0.000363 *5* α(N)=8.33×10^{-5} *12*; α(O)=1.325×10^{-5} *19*; α(P)=1.339×10^{-6} *19* α(K)exp=0.012 *1*.
[x]611.61 *5*	1.25 *20*							
[x]611.943 *15*	2.7 *3*					E2,M1	0.0110[j] *31*	α(K)=0.0093 *27*; α(L)=0.0014 *3*; α(M)=0.00029 *6*

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

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
								α(N)=6.7×10^{-5} *14*; α(O)=1.05×10^{-5} *24*; α(P)=9.8×10^{-7} *32* α(K)exp=0.0083 *25*.
[x]615.063 *24*	1.0 *2*							
616.825 *21*	1.43 *14*	973.992	9/2$^-$	357.169	11/2$^-$	M1	0.01377	α(K)=0.01173 *17*; α(L)=0.001601 *23*; α(M)=0.000344 *5* α(N)=7.89×10^{-5} *11*; α(O)=1.256×10^{-5} *18*; α(P)=1.269×10^{-6} *18* α(K)exp=0.014 *4*.
627.021 *10*	3.5 *2*	881.689	7/2$^-$	254.665	9/2$^-$	M1	0.01322	α(K)=0.01127 *16*; α(L)=0.001537 *22*; α(M)=0.000330 *5* α(N)=7.57×10^{-5} *11*; α(O)=1.205×10^{-5} *17*; α(P)=1.218×10^{-6} *17* α(K)exp=0.010 *2*.
[x]627.927 *18*	1.94 *18*							
[x]628.836 *10*	2.66 *20*					M1	0.01313	α(K)=0.01118 *16*; α(L)=0.001526 *22*; α(M)=0.000328 *5* α(N)=7.52×10^{-5} *11*; α(O)=1.196×10^{-5} *17*; α(P)=1.209×10^{-6} *17* α(K)exp=0.010 *3*.
[x]629.72 *3*	1.25 *20*							
631.023[m] *4*	15.3[m] *14*	876.831	(1/2)$^+$	245.777	3/2$^+$	#		α(K)exp=0.0095 *15*.
631.023[m] *4*	15.3[m] *14*	1132.029	(7/2)$^+$	501.006	9/2$^+$	#		α(K)exp=0.0095 *15*.
[x]632.00 *4*	1.33 *18*					M1	0.01296	α(K)=0.01105 *16*; α(L)=0.001506 *21*; α(M)=0.000324 *5* α(N)=7.42×10^{-5} *11*; α(O)=1.181×10^{-5} *17*; α(P)=1.194×10^{-6} *17* α(K)exp=0.018 *6*.
[x]643.040 *20*	1.0 *2*							
648.56[h] *6*	3.1 *6*	817.669	5/2$^-$	169.009	7/2$^-$	M1	0.01216	α(K)=0.01036 *15*; α(L)=0.001412 *20*; α(M)=0.000304 *5* α(N)=6.95×10^{-5} *10*; α(O)=1.107×10^{-5} *16*; α(P)=1.119×10^{-6} *16* α(K)exp=0.010 *3*.
648.88[h] *7*	11.2 *14*	956.350	5/2$^+$	307.383	5/2$^+$	M1	0.01214	α(K)=0.01035 *15*; α(L)=0.001410 *20*; α(M)=0.000303 *5* α(N)=6.95×10^{-5} *10*; α(O)=1.106×10^{-5} *16*; α(P)=1.118×10^{-6} *16* α(K)exp=0.0089 *14*.
[x]651.24 *4*	2.0 *4*					M1,E2	0.0094 *26*	α(K)=0.0080 *23*; α(L)=0.00115 *25*; α(M)=0.00025 *6* α(N)=5.7×10^{-5} *12*; α(O)=8.9×10^{-6} *21*; α(P)=8.4×10^{-7} *27* α(K)exp=0.010 *4*.
662.149 *8*	6.5 *4*	1053.631	7/2$^+$	391.484	7/2$^+$	M1	0.01155	α(K)=0.00984 *14*; α(L)=0.001340 *19*; α(M)=0.000288 *4* α(N)=6.60×10^{-5} *10*; α(O)=1.051×10^{-5} *15*; α(P)=1.063×10^{-6} *15* α(K)exp=0.0097 *11*.
664.122 *7*	4.3 *6*	768.428	3/2$^-$	104.334	5/2$^-$	M1	0.01147	α(K)=0.00977 *14*; α(L)=0.001330 *19*; α(M)=0.000286 *4* α(N)=6.55×10^{-5} *10*; α(O)=1.043×10^{-5} *15*; α(P)=1.055×10^{-6} *15* α(K)exp=0.012 *2*.
665.423 *5*	7.0 *6*	911.213	3/2$^+$	245.777	3/2$^+$	M1	0.01141	α(K)=0.00972 *14*; α(L)=0.001324 *19*; α(M)=0.000285 *4* α(N)=6.52×10^{-5} *10*; α(O)=1.038×10^{-5} *15*; α(P)=1.050×10^{-6} *15* α(K)exp=0.0096 *12*.
[x]667.190 *21*	1.70 *16*					M1	0.01134	α(K)=0.00966 *14*; α(L)=0.001315 *19*; α(M)=0.000283 *4* α(N)=6.48×10^{-5} *9*; α(O)=1.031×10^{-5} *15*; α(P)=1.043×10^{-6} *15* α(K)exp=0.011 *4*.
[x]668.90 *3*	1.43 *16*					M1	0.01126	α(K)=0.00960 *14*; α(L)=0.001307 *19*; α(M)=0.000281 *4*

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
								α(N)=6.44×10^{-5} *9*; α(O)=1.025×10^{-5} *15*; α(P)=1.037×10^{-6} *15* α(K)exp=0.015 *5*.
[x]670.658 *15*	3.2[f] *6*					M1	0.01119	α(K)=0.00954 *14*; α(L)=0.001298 *19*; α(M)=0.000279 *4* α(N)=6.39×10^{-5} *9*; α(O)=1.018×10^{-5} *15*; α(P)=1.030×10^{-6} *15* α(K)exp=0.013 *3*.
672.09 *5*	0.5 *1*	979.474	5/2$^+$	307.383	5/2$^+$			
673.07 *7*	0.4 *1*	1064.663	(3/2)$^+$	391.484	7/2$^+$			
[x]673.95 *3*	0.82 *12*							
677.406[m] *6*	9.8[m] *8*	923.148	1/2$^+$	245.777	3/2$^+$	@		α(K)exp=0.009 *1*.
677.406[m] *6*	9.8[m] *8*	1068.891	5/2$^+$	391.484	7/2$^+$	@		α(K)exp=0.009 *1*.
[x]681.267 *21*	1.64 *16*					M1	0.01077	α(K)=0.00918 *13*; α(L)=0.001248 *18*; α(M)=0.000268 *4* α(N)=6.15×10^{-5} *9*; α(O)=9.79×10^{-6} *14*; α(P)=9.91×10^{-7} *14* α(K)exp=0.011 *3*.
[x]686.79 *3*	1.02 *12*							
[x]688.841 *21*	2.66 *20*					M1	0.01048	α(K)=0.00893 *13*; α(L)=0.001214 *17*; α(M)=0.000261 *4* α(N)=5.98×10^{-5} *9*; α(O)=9.52×10^{-6} *14*; α(P)=9.64×10^{-7} *14* α(K)exp=0.012 *3*.
699.939 *7*	5.5 *4*	1007.309	3/2$^+$	307.383	5/2$^+$	M1	0.01007	α(K)=0.00859 *12*; α(L)=0.001167 *17*; α(M)=0.000251 *4* α(N)=5.75×10^{-5} *8*; α(O)=9.15×10^{-6} *13*; α(P)=9.26×10^{-7} *13* α(K)exp=0.0086 *13*.
710.65 *3*	4.1 *4*	956.350	5/2$^+$	245.777	3/2$^+$	M1,E2	0.0076 *21*	α(K)=0.0065 *19*; α(L)=0.00092 *21*; α(M)=0.00020 *5* α(N)=4.6×10^{-5} *10*; α(O)=7.2×10^{-6} *17*; α(P)=6.8×10^{-7} *21* α(K)exp=0.0066 *20*.
712.7 *2*	1.8 *4*	881.689	7/2$^-$	169.009	7/2$^-$			
713.31 *5*	3.1 *3*	817.669	5/2$^-$	104.334	5/2$^-$	M1	0.00961	α(K)=0.00820 *12*; α(L)=0.001113 *16*; α(M)=0.000239 *4* α(N)=5.48×10^{-5} *8*; α(O)=8.73×10^{-6} *13*; α(P)=8.84×10^{-7} *13* α(K)exp=0.0072 *16*.
[x]714.557 *22*	2.9 *6*					M1,E2	0.0075 *21*	α(K)=0.0064 *18*; α(L)=0.00091 *20*; α(M)=0.00020 *5* α(N)=4.5×10^{-5} *10*; α(O)=7.1×10^{-6} *17*; α(P)=6.7×10^{-7} *21* α(K)exp=0.0055 *19*.
[x]714.987 *13*	7.2 *10*					M1	0.00956	α(K)=0.00815 *12*; α(L)=0.001107 *16*; α(M)=0.000238 *4* α(N)=5.45×10^{-5} *8*; α(O)=8.68×10^{-6} *13*; α(P)=8.79×10^{-7} *13* α(K)exp=0.0071 *13*.
[x]717.12 *15*	0.51 *16*							
719.34 *10*	0.61 *14*	973.992	9/2$^-$	254.665	9/2$^-$			
[x]726.68 *6*	0.72 *14*							
[x]729.86 *7*	1.90 *18*							
[x]737.09 *3*	1.25 *25*					M1	0.00887	α(K)=0.00756 *11*; α(L)=0.001026 *15*; α(M)=0.000221 *3* α(N)=5.05×10^{-5} *7*; α(O)=8.05×10^{-6} *12*; α(P)=8.15×10^{-7} *12* α(K)exp=0.014 *9*.
[x]738.64[d] *5*	2.25[d] *20*					M1	0.00882	α(K)=0.00753 *11*; α(L)=0.001021 *15*; α(M)=0.000219 *3*

$^{155}_{63}Eu_{92}$-14

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
								α(N)=5.03×10^{-5} *7*; α(O)=8.00×10^{-6} *12*; α(P)=8.11×10^{-7} *12* α(K)exp=0.010 *4*.
740.532 *14*	2.7 *3*	1132.029	(7/2)$^+$	391.484	7/2$^+$	M1	0.00877	α(K)=0.00748 *11*; α(L)=0.001014 *15*; α(M)=0.000218 *3* α(N)=4.99×10^{-5} *7*; α(O)=7.95×10^{-6} *12*; α(P)=8.06×10^{-7} *12* α(K)exp=0.0086 *27*.
[x]741.783 *12*	3.65 *25*					M1,E2	0.0069 *19*	α(K)=0.0058 *17*; α(L)=0.00083 *19*; α(M)=0.00018 *4* α(N)=4.1×10^{-5} *9*; α(O)=6.4×10^{-6} *15*; α(P)=6.2×10^{-7} *19* α(K)exp=0.0055 *23*.
[x]742.88 *7*	3.20 *16*					M1,E2	0.0069 *19*	α(K)=0.0058 *16*; α(L)=0.00082 *19*; α(M)=0.00018 *4* α(N)=4.1×10^{-5} *9*; α(O)=6.4×10^{-6} *15*; α(P)=6.1×10^{-7} *19* α(K)exp=0.0056 *20*.
746.18 *3*	3.13 *25*	1053.631	7/2$^+$	307.383	5/2$^+$	M1	0.00861	α(K)=0.00734 *11*; α(L)=0.000995 *14*; α(M)=0.000214 *3* α(N)=4.90×10^{-5} *7*; α(O)=7.81×10^{-6} *11*; α(P)=7.91×10^{-7} *11* α(K)exp=0.0077 *20*.
747.40 *3*	1.74 *16*	1054.838	7/2$^+$	307.383	5/2$^+$			
[x]753.78 *3*	1.53 *12*							
[x]756.562 *13*	4.3 *3*					M1	0.00832	α(K)=0.00710 *10*; α(L)=0.000962 *14*; α(M)=0.000207 *3* α(N)=4.74×10^{-5} *7*; α(O)=7.54×10^{-6} *11*; α(P)=7.65×10^{-7} *11* α(K)exp=0.0067 *15*.
757.300 *20*	2.25 *20*	1064.663	(3/2)$^+$	307.383	5/2$^+$			E$_\gamma$: given as 757.3000 *20* by 1986Pr03.
761.504[m] *10*	4.1[m] *4*	1007.309	3/2$^+$	245.777	3/2$^+$	&		α(K)exp=0.0071 *16*.
761.504[m] *10*	4.1[m] *4*	1068.891	5/2$^+$	307.383	5/2$^+$	&		α(K)exp=0.0071 *16*.
768.27 *7*	0.53 *18*	768.428	3/2$^-$	0.0	5/2$^+$			
[x]769.30 *5*	1.25 *12*					M1	0.00799	α(K)=0.00681 *10*; α(L)=0.000923 *13*; α(M)=0.000198 *3* α(N)=4.54×10^{-5} *7*; α(O)=7.24×10^{-6} *11*; α(P)=7.34×10^{-7} *11* α(K)exp=0.0012 *5*.
[x]776.61 *3*	1.0 *3*							
[x]781.51 *5*	0.72 *8*							
[x]783.20 *7*	0.78 *12*							
[x]784.61 *10*	0.49 *12*							
[x]787.89 *6*	1.73 *20*							
[x]789.769 *20*	6.1 *4*					E2	0.00437	α(K)=0.00367 *6*; α(L)=0.000552 *8*; α(M)=0.0001199 *17* α(N)=2.73×10^{-5} *4*; α(O)=4.25×10^{-6} *6*; α(P)=3.76×10^{-7} *6* α(K)exp=0.0038 *10*.
[x]794.13 *5*	1.02 *14*							
[x]799.32 *7*	1.6 *3*					M1	0.00728	α(K)=0.00621 *9*; α(L)=0.000840 *12*; α(M)=0.000180 *3* α(N)=4.13×10^{-5} *6*; α(O)=6.59×10^{-6} *10*; α(P)=6.68×10^{-7} *10* α(K)exp=0.009 *4*.
800.21 *6*	1.74 *22*	979.474	5/2$^+$	179.157	9/2$^+$			
[x]802.69 *6*	0.57 *14*							
[x]805.705 *17*	1.25 *25*							
[x]808.29 *4*	1.70 *12*					M1,E2	0.0056 *15*	α(K)=0.0048 *13*; α(L)=0.00067 *15*; α(M)=0.00014 *4*

$^{155}_{63}Eu_{92}$-15

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
								α(N)=3.3×10^{-5} *8*; α(O)=5.2×10^{-6} *12*; α(P)=5.0×10^{-7} *15* α(K)exp=0.0070 *35*.
817.61 *4*	0.98 *10*	817.669	5/2$^-$	0.0	5/2$^+$			
818.84[m] *3*	1.05[m] *12*	1064.663	(3/2)$^+$	245.777	3/2$^+$	*a*		α(K)exp=0.045 *9*.
818.84[m] *3*	1.05[m] *12*	1126.26?	(5/2$^+$)	307.383	5/2$^+$	*a*		α(K)exp=0.045 *9*.
[x]820.97 *8*	0.95 *10*					M1	0.00682	α(K)=0.00582 *9*; α(L)=0.000787 *11*; α(M)=0.0001690 *24* α(N)=3.87×10^{-5} *6*; α(O)=6.17×10^{-6} *9*; α(P)=6.26×10^{-7} *9* α(K)exp=0.013 *7*.
[x]822.75 *3*	2.76 *20*					E1,E2		α(K)exp ≈ 0.0022.
[x]823.960 *24*	1.75 *25*					M1	0.00676	α(K)=0.00577 *8*; α(L)=0.000780 *11*; α(M)=0.0001675 *24* α(N)=3.84×10^{-5} *6*; α(O)=6.11×10^{-6} *9*; α(P)=6.21×10^{-7} *9* α(K)exp=0.0086 *43*.
[x]826.36 *10*	0.55 *12*							
[x]829.11 *15*	1.0 *2*							
[x]830.65 *15*	0.82 *20*							
[x]833.726[g] *24*	1.75[g] *16*							
[x]835.28 *6*	0.74 *16*							
838.88 *4*	2.76 *22*	1007.988	5/2$^-$,7/2$^-$	169.009	7/2$^-$	M1,E2	0.0051 *14*	α(K)=0.0044 *12*; α(L)=0.00061 *14*; α(M)=0.00013 *3* α(N)=3.0×10^{-5} *7*; α(O)=4.8×10^{-6} *11*; α(P)=4.6×10^{-7} *14* α(K)exp=0.0058 *22*.
[x]843.61 *10*	0.72 *20*							
[x]845.99 *4*	1.43 *16*							
[x]848.25 *10*	1.88 *18*							
[x]849.75 *4*	1.74 *14*							
850.78 *10*	0.84 *16*	1151.41	9/2$^+$	300.688	11/2$^+$			
[x]854.15 *7*	1.96 *20*							
[x]857.07 *4*	1.3 *3*							
[x]858.27 *6*	1.15 *12*							
[x]861.26 *15*	0.45 *14*							
[x]863.94 *11*	0.63 *18*							
[x]867.20 *4*	1.64 *18*							
[x]879.53 *6*	1.4 *3*					M1	0.00577	α(K)=0.00493 *7*; α(L)=0.000665 *10*; α(M)=0.0001427 *20* α(N)=3.27×10^{-5} *5*; α(O)=5.21×10^{-6} *8*; α(P)=5.30×10^{-7} *8* α(K)exp=0.010 *5*.
880.34[n] *5*	1.23 *22*	1126.26?	(5/2$^+$)	245.777	3/2$^+$			
883.725 *13*	4.0 *3*	1138.389	7/2$^+$	254.665	9/2$^-$	(E1)	1.37×10^{-3}	α(K)=0.001176 *17*; α(L)=0.0001530 *22*; α(M)=3.27×10^{-5} *5* α(N)=7.47×10^{-6} *11*; α(O)=1.182×10^{-6} *17*; α(P)=1.173×10^{-7} *17* α(K)exp=0.0028 *15*. Mult.: from α data, mult=E2,E1, but placement requires a parity change.
885.89 *4*	1.15 *12*	1054.838	7/2$^+$	169.009	7/2$^-$			
[x]891.52 *3*	2.3 *3*							

$^{155}_{63}Eu_{92}$-16

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
[x]896.865 *20*	3.5 *3*							
898.455 *20*	2.86 *20*	977.198	7/2$^+$	78.638	7/2$^+$	M1,E2	0.0044 *11*	α(K)=0.00373 *96*; α(L)=0.00052 *12*; α(M)=0.000112 *24* α(N)=2.6×10^{-5} *6*; α(O)=4.0×10^{-6} *10*; α(P)=3.9×10^{-7} *11* α(K)exp=0.0056 *28*.
900.847 *16*	5.3 *6*	979.474	5/2$^+$	78.638	7/2$^+$	M1	0.00545	α(K)=0.00465 *7*; α(L)=0.000627 *9*; α(M)=0.0001346 *19* α(N)=3.08×10^{-5} *5*; α(O)=4.91×10^{-6} *7*; α(P)=5.00×10^{-7} *7* α(K)exp=0.0042 *12*.
903.654 *10*	6.5 *6*	1007.988	5/2$^-$,7/2$^-$	104.334	5/2$^-$	M1	0.00541	α(K)=0.00462 *7*; α(L)=0.000622 *9*; α(M)=0.0001336 *19* α(N)=3.06×10^{-5} *5*; α(O)=4.88×10^{-6} *7*; α(P)=4.96×10^{-7} *7* α(K)exp=0.0045 *8*.
[x]909.90 *11*	2.7 *6*							
[x]910.43[g] *14*	1.17[g] *24*							
[x]917.420 *25*	2.3 *3*							
[x]920.68 *8*	1.08 *14*							
923.08[n] *3*	2.0 *3*	923.148	1/2$^+$	0.0	5/2$^+$			
929.24 *8*	1.6 *8*	1007.988	5/2$^-$,7/2$^-$	78.638	7/2$^+$			
[x]930.56 *7*	1.7 *3*							
932.624 *16*	4.1 *3*	1101.670	3/2$^-$	169.009	7/2$^-$	(E2)	0.00303	α(K)=0.00256 *4*; α(L)=0.000371 *6*; α(M)=8.03×10^{-5} *12* α(N)=1.83×10^{-5} *3*; α(O)=2.87×10^{-6} *4*; α(P)=2.63×10^{-7} *4* α(K)exp=0.0039 *15*. Mult.: α(K)exp=0.0039 *15* (from (2n,γ), 1986Pr03) allows mult=M1,E2. Placement in the level scheme requires ΔJ=2.
[x]934.49[h] *4*	0.98 *18*					E0+M1+E2	0.0040 *10*	α(K)=0.00341 *86*; α(L)=0.00047 *11*; α(M)=0.000102 *22* α(N)=2.3×10^{-5} *5*; α(O)=3.7×10^{-6} *9*; α(P)=3.60×10^{-7} *98* α(K)exp=0.032 *8*.
[x]936.325 *17*	6.3 *4*					E1	1.23×10^{-3}	α(K)=0.001052 *15*; α(L)=0.0001367 *20*; α(M)=2.92×10^{-5} *4* α(N)=6.67×10^{-6} *10*; α(O)=1.056×10^{-6} *15*; α(P)=1.052×10^{-7} *15* α(K)exp<0.0013.
939.14 *5*	2.15 *16*	1193.79	7/2$^+$	254.665	9/2$^-$			
[x]942.18 *9*	1.43 *20*							
[x]943.86[h] *7*	<1.0					E0+M1+E2	0.0039 *10*	α(K)=0.00333 *84*; α(L)=0.00046 *10*; α(M)=9.9×10^{-5} *22* α(N)=2.3×10^{-5} *5*; α(O)=3.6×10^{-6} *8*; α(P)=3.52×10^{-7} *95* α(K)exp>0.013.
[x]948.10 *4*	3.48 *25*					M1	0.00482	α(K)=0.00412 *6*; α(L)=0.000554 *8*; α(M)=0.0001189 *17* α(N)=2.72×10^{-5} *4*; α(O)=4.34×10^{-6} *6*; α(P)=4.42×10^{-7} *7* α(K)exp=0.0040 *12*.
[x]950.82 *8*	2.05 *20*							
[x]958.46 *10*	1.8 *4*					M1	0.00470	α(K)=0.00401 *6*; α(L)=0.000539 *8*; α(M)=0.0001158 *17* α(N)=2.65×10^{-5} *4*; α(O)=4.23×10^{-6} *6*; α(P)=4.30×10^{-7} *6* α(K)exp=0.0050 *17*.

$^{155}_{63}Eu_{92}$-17

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[l]	Comments
959.05[h] *8*	2.0 *4*	1138.389	7/2$^+$	179.157	9/2$^+$	M1		0.00469	α(K)=0.00401 *6*; α(L)=0.000538 *8*; α(M)=0.0001156 *17* α(N)=2.65×10^{-5} *4*; α(O)=4.22×10^{-6} *6*; α(P)=4.30×10^{-7} *6* α(K)exp=0.005 *2*.
[x]961.568 *14*	10.0 *4*					E1		1.17×10^{-3}	α(K)=0.001001 *14*; α(L)=0.0001298 *19*; α(M)=2.77×10^{-5} *4* α(N)=6.34×10^{-6} *9*; α(O)=1.003×10^{-6} *14*; α(P)=1.000×10^{-7} *14* α(K)exp=0.0013 *4*.
[x]968.42 *6*	3.5 *7*					M1		0.00458	α(K)=0.00391 *6*; α(L)=0.000526 *8*; α(M)=0.0001129 *16* α(N)=2.59×10^{-5} *4*; α(O)=4.12×10^{-6} *6*; α(P)=4.20×10^{-7} *6* α(K)exp=0.0037 *13*.
969.33 *3*	7.1 *4*	1138.389	7/2$^+$	169.009	7/2$^-$	E1		1.15×10^{-3}	α(K)=0.000986 *14*; α(L)=0.0001278 *18*; α(M)=2.73×10^{-5} *4* α(N)=6.24×10^{-6} *9*; α(O)=9.88×10^{-7} *14*; α(P)=9.86×10^{-8} *14* α(K)exp=0.0014 *4*.
972.32 *6*	2.2 *3*	1151.41	9/2$^+$	179.157	9/2$^+$	M1+(E0)			α(K)exp=0.0079 *26*.
976.20[h] *4*	1.64 *32*	1054.838	7/2$^+$	78.638	7/2$^+$	E0+(M1)+E2		0.0036 *9*	α(K)=0.0031 *8*; α(L)=0.00042 *10*; α(M)=9.1×10^{-5} *20* α(N)=2.1×10^{-5} *5*; α(O)=3.3×10^{-6} *8*; α(P)=3.26×10^{-7} *87* α(K)exp=0.020 *6*.
977.331 *23*	6.6 *3*	977.198	7/2$^+$	0.0	5/2$^+$	M1		0.00448	α(K)=0.00383 *6*; α(L)=0.000514 *8*; α(M)=0.0001104 *16* α(N)=2.53×10^{-5} *4*; α(O)=4.03×10^{-6} *6*; α(P)=4.11×10^{-7} *6* α(K)exp=0.0038 *9*.
979.463 *17*	6.7 *3*	979.474	5/2$^+$	0.0	5/2$^+$	E0+(M1)+E2		0.0036 *9*	α(K)=0.0031 *8*; α(L)=0.00042 *9*; α(M)=9.1×10^{-5} *20* α(N)=2.1×10^{-5} *5*; α(O)=3.3×10^{-6} *8*; α(P)=3.23×10^{-7} *86* α(K)exp=0.0152 *14*.
984.97 *7*	0.3 *1*	1230.776	5/2$^+$	245.777	3/2$^+$				
[x]986.52 *8*	1.92 *25*								
[x]987.50 *6*	2.2 *4*								
[x]993.42[g] *14*	1.0[g] *2*								
997.355 *25*	6.0 *3*	1101.670	3/2$^-$	104.334	5/2$^-$	(E2)		0.00263	α(K)=0.00223 *4*; α(L)=0.000318 *5*; α(M)=6.87×10^{-5} *10* α(N)=1.568×10^{-5} *22*; α(O)=2.46×10^{-6} *4*; α(P)=2.29×10^{-7} *4* α(K)exp=0.0020 *10*. Mult.: from α data, mult=E1,E2, but placement eliminates E1.

$^{155}_{63}Eu_{92}$-18

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
1002.38 *5*	2.9 *3*	1106.799	(1/2)$^-$,3/2$^-$,5/2$^-$	104.334	5/2$^-$	M1	0.00422	α(K)=0.00360 *5*; α(L)=0.000484 *7*; α(M)=0.0001039 *15* α(N)=2.38×10^{-5} *4*; α(O)=3.79×10^{-6} *6*; α(P)=3.86×10^{-7} *6* α(K)exp=0.0045 *15*.
[x]1004.96 *5*	1.74 *20*							
1008.03 *3*	4.10 *25*	1007.988	5/2$^-$,7/2$^-$	0.0	5/2$^+$	E1	1.07×10^{-3}	α(K)=0.000916 *13*; α(L)=0.0001186 *17*; α(M)=2.53×10^{-5} *4* α(N)=5.79×10^{-6} *9*; α(O)=9.17×10^{-7} *13*; α(P)=9.16×10^{-8} *13* α(K)exp<0.0019.
[x]1009.73 *5*	2.37 *22*							
[x]1012.878 *21*	4.6 *3*					E1	1.06×10^{-3}	α(K)=0.000908 *13*; α(L)=0.0001175 *17*; α(M)=2.51×10^{-5} *4* α(N)=5.73×10^{-6} *8*; α(O)=9.09×10^{-7} *13*; α(P)=9.08×10^{-8} *13*
1017.54 *11*	1.34 *4*	1096.18	(3/2$^+$,5/2$^+$)	78.638	7/2$^+$			
1021.81[n] *11*	3.2 *4*	1126.26?	(5/2$^+$)	104.334	5/2$^-$			
1024.76 *5*	3.4 *4*	1193.79	7/2$^+$	169.009	7/2$^-$			
[x]1025.77 *8*	2.1 *4*							
[x]1027.27 *9*	2.37 *21*							
1034.15 *4*	2.90 *23*	1138.389	7/2$^+$	104.334	5/2$^-$			
[x]1038.75 *12*	1.8 *3*					E0+M1+E2	0.0031 *8*	α(K)=0.0027 *7*; α(L)=0.00037 *8*; α(M)=7.9×10^{-5} *17* α(N)=1.8×10^{-5} *4*; α(O)=2.9×10^{-6} *7*; α(P)=2.83×10^{-7} *73* α(K)exp=0.012 *4*.
[x]1052.71 *7*	1.6 *3*							
1054.86 *4*	4.4 *3*	1054.838	7/2$^+$	0.0	5/2$^+$	M1	0.00374	α(K)=0.00319 *5*; α(L)=0.000428 *6*; α(M)=9.19×10^{-5} *13* α(N)=2.10×10^{-5} *3*; α(O)=3.36×10^{-6} *5*; α(P)=3.42×10^{-7} *5* α(K)exp=0.0034 *9*.
[x]1056.51 *16*	2.00 *23*							
[x]1059.24 *5*	2.78 *23*							
1061.44[g] *7*	2.50[g] *25*	1315.94	5/2$^-$,7/2,9/2$^-$	254.665	9/2$^-$			
1064.71 *5*	4.5 *6*	1064.663	(3/2)$^+$	0.0	5/2$^+$	M1	0.00366	α(K)=0.00312 *5*; α(L)=0.000419 *6*; α(M)=8.98×10^{-5} *13* α(N)=2.06×10^{-5} *3*; α(O)=3.28×10^{-6} *5*; α(P)=3.35×10^{-7} *5* α(K)exp=0.0040 *13*.
1072.67 *6*	1.7 *3*	1151.41	9/2$^+$	78.638	7/2$^+$			
[x]1082.11 *8*								
[x]1082.60 *7*	2.0 *3*							
[x]1086.59 *8*	2.11 *18*							
1089.47 *5*	3.2 *3*	1193.79	7/2$^+$	104.334	5/2$^-$			

$^{155}_{63}Eu_{92}$-19

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[l]	Comments
[x]1091.31[g] 3	6.0[g] 5							
1096.17 6	2.52 22	1096.18	(3/2$^+$,5/2$^+$)	0.0	5/2$^+$			
[x]1108.46 5	2.80 22							
[x]1117.60 10	3.8 6							
[x]1121.24[g] 17	2.4[g] 3							
1126.38[m] 6	4.4[m] 6	1126.26?	(5/2$^+$)	0.0	5/2$^+$			
1126.38[m] 6	4.4[m] 6	1230.776	5/2$^+$	104.334	5/2$^-$			
1138.31 12	2.17 21	1138.389	7/2$^+$	0.0	5/2$^+$			
[x]1139.84 5	1.8 4							
1146.56 12	2.56 22	1315.94	5/2$^-$,7/2,9/2$^-$	169.009	7/2$^-$			
[x]1156.81 8	4.5 3							
1159.52 10	4.6 3	1264.045?	3/2$^-$,5/2$^-$	104.334	5/2$^-$	M1	0.00299	α(K)=0.00256 4; α(L)=0.000341 5; α(M)=7.33×10^{-5} 11 α(N)=1.678×10^{-5} 24; α(O)=2.68×10^{-6} 4; α(P)=2.73×10^{-7} 4; α(IPF)=2.41×10^{-6} 4 α(K)exp=0.0039 13.
[x]1170.15 6	2.3 3							
[x]1174.962 22	8.4 4					E2,E1		
[x]1185.08 9	2.5 5							
[x]1187.03 5	3.1 3							
[x]1196.36 7	6.9 13					(E1)	8.04×10^{-4}	α(K)=0.000670 10; α(L)=8.62×10^{-5} 12; α(M)=1.84×10^{-5} 3 α(N)=4.21×10^{-6} 6; α(O)=6.68×10^{-7} 10; α(P)=6.72×10^{-8} 10; α(IPF)=2.39×10^{-5} 4 α(K)exp<0.0014.
[x]1199.6 3	1.9 3							
[x]1201.5 4	1.5 3							
[x]1203.36 16	2.0 5							
[x]1208.24[g] 12	5.0[g] 7							
1211.49 14	2.3 3	1315.94	5/2$^-$,7/2,9/2$^-$	104.334	5/2$^-$			
1223.02 9	3.1 4	1301.59	5/2,7/2$^+$	78.638	7/2$^+$			
[x]1227.18 14	2.2 5							
1230.79 3	0.5 2	1230.776	5/2$^+$	0.0	5/2$^+$			
[x]1235.40 11	2.43 24							
[x]1239.59 20	2.9 3							
[x]1246.09[g] 13	2.6[g] 3							
[x]1258.37 7	4.1 4							
[x]1259.53 25	2.3 8							
[x]1262.76 10	2.30 23							
[x]1272.31 24	4.1 7							
[x]1273.68 14	5.8 8							
[x]1281.19 23	3.1 6							
[x]1285.09[g] 23								
[x]1290.0 3	2.1 5							
1301.56 5	6.3 6	1301.59	5/2,7/2$^+$	0.0	5/2$^+$			

$^{155}_{63}Eu_{92}$-20

^{153}Eu(2n,γ) 1986Pr03 (continued)

γ(^{155}Eu) (continued)

E_γ	I_γ[k]	E_i(level)	J_i^π	E_f	J_f^π
[x]1308.44[g] *23*	2.0[g] *4*				
[x]1318.13 *13*	3.0 *3*				
[x]1324.53[g] *17*	3.0[g] *3*				
[x]1336.0 *3*	1.9 *6*				
[x]1341.30 *21*	1.8 *3*				
[x]1350.55 *20*	1.5 *5*				
[x]1359.98[g] *25*	3.3[g] *5*				
[x]1373.5 *3*	2.2 *7*				
[x]1392.6 *3*	1.9 *5*				
1453.40 *17*	2.7 *6*	1632.56	7/2$^+$	179.157	9/2$^+$
1469.94 *18*	2.8 *3*	1548.58	(5/2$^+$)	78.638	7/2$^+$
1483.02 *8*	5.1 *3*	1483.04	3/2$^+$	0.0	5/2$^+$
[x]1513.9 *5*	1.4 *3*				
[x]1543.9 *3*	3.4 *3*				
[x]1578.0 *3*	2.7 *4*				
[x]1609.5 *4*	3.0 *11*				
[x]1656.7 *3*	3.9 *9*				
6668.2 *3*	0.71[i] *6*	8151.4		1483.04	3/2$^+$
6790.4[bn] *3*	1.02[i] *7*	8151.4			
6835.59 *24*	2.10[i] *12*	8151.4		1315.94	5/2$^-$,7/2,9/2$^-$
6920.6 *3*	0.75[i] *6*	8151.4		1230.776	5/2$^+$
6957.90 *25*	2.78[i] *15*	8151.4		1193.79	7/2$^+$
7012.8 *3*	3.45[i] *19*	8151.4		1138.389	7/2$^+$
7033.8[bn] *4*	0.13[i] *1*	8151.4			
7088.5 *6*	0.42[i] *6*	8151.4		1064.663	(3/2)$^+$
7097.4 *3*	2.59[i] *15*	8151.4		1053.631	7/2$^+$
7143.5 *3*	1.05[i] *7*	8151.4		1007.988	5/2$^-$,7/2$^-$
7171.7 *3*	4.26[i] *22*	8151.4		979.474	5/2$^+$
7240.0 *3*	1.01[i] *6*	8151.4		911.213	3/2$^+$
7334.2 *6*	0.26[i] *3*	8151.4		817.669	5/2$^-$
7382.3 *4*	0.47[i] *4*	8151.4		768.428	3/2$^-$
7844.2 *5*	0.44[i] *5*	8151.4		307.383	5/2$^+$
7905.7 *4*	2.21[i] *12*	8151.4		245.777	3/2$^+$
7982.6 *6*	0.31[i] *3*	8151.4		169.009	7/2$^-$
8073.0 *4*	3.65[i] *19*	8151.4		78.638	7/2$^+$

† Obtained by comparison of measured conversion coefficients for various subshells with theoretical values (1986Pr03).

‡ Recalculated by evaluator based on various ratios of subshell ICC′s from Table 2 of 1986Pr03 (also listed here in comments). Also given in comments for comparison are the δ values calculated by 1986Pr03 based on the same data.

From α(K)exp=0.0095 *15*, 1986Pr03 assign mult=M1 to this line. However, since it is doubly placed, the α(K)exp value may not give the correct mult for each placement.

@ From α(K)exp=0.009 *1*, 1986Pr03 assign mult=M1 to this line. Since it is doubly placed, however, the α(K)exp value may not give the correct mult for each placement.

& From α(K)exp=0.0071 *16*, 1986Pr03 assign mult=M1 to this line. However, since it is doubly placed, the α(K)exp value may not give the correct mult for each placement.

a From α(K)exp=0.045 *9*, 1986Pr03 conclude that this line has an E0 component. Since this transition is doubly placed, however, this component may be associated with only one of these placements, or with both. It is thus not clear where in the level scheme this E0 strength is to be located.

b The final level implied by this placement is not otherwise reported. Note that this transition is questionable.

c May be in ^{154}Eu.

d May be in ^{156}Eu.

e Has some contribution from a ^{154}Eu line.

f Has some contribution from a ^{156}Eu line.

g This γ line has a complex structure.

$^{155}_{63}Eu_{92}$-21

γ(^{155}Eu) (continued)

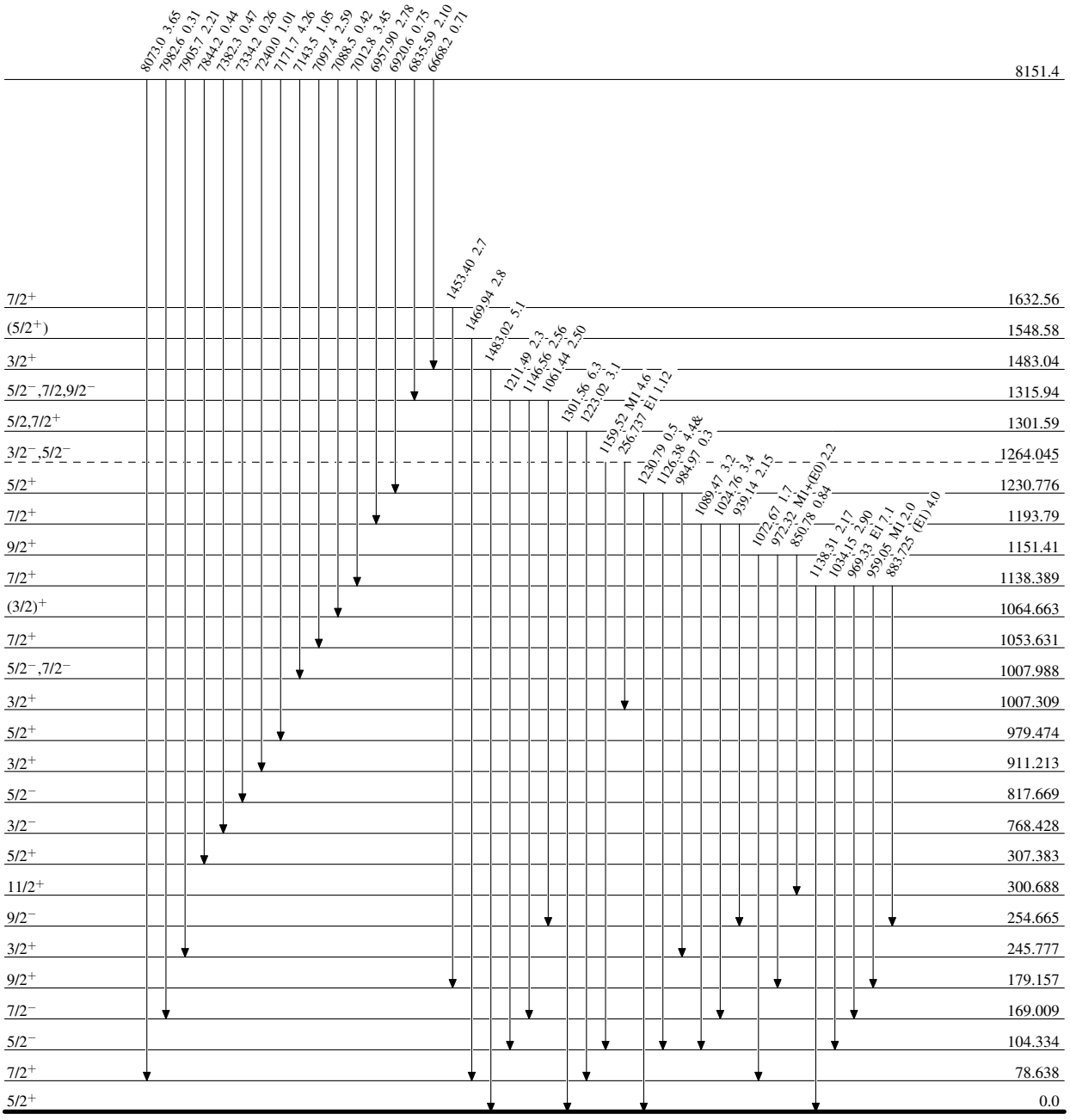
[h] From conversion-electron spectrum.
[i] Iγ values for the primary capture γ rays are relative ones only. They do not represent absolute (γ per 1000 n captures) values.
[j] Listed value is the average of the theoretical values for α(M1) and α(E2).
[k] Intensity per 1000 n captures for the secondary γ's only. For the primary transitions, the values are relative ones only.
[l] Additional information 3.
[m] Multiply placed with undivided intensity.
[n] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{153}Eu(2n,γ) 1986Pr03

Level Scheme

Intensities: Iγ per 1000 N captures for the secondary γ's. For the primary transitions, the values are relative ones only. Transitions, the values are relative ones only.
& Multiply placed: undivided intensity given

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



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

^{153}Eu(2n,γ) 1986Pr03

Legend

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

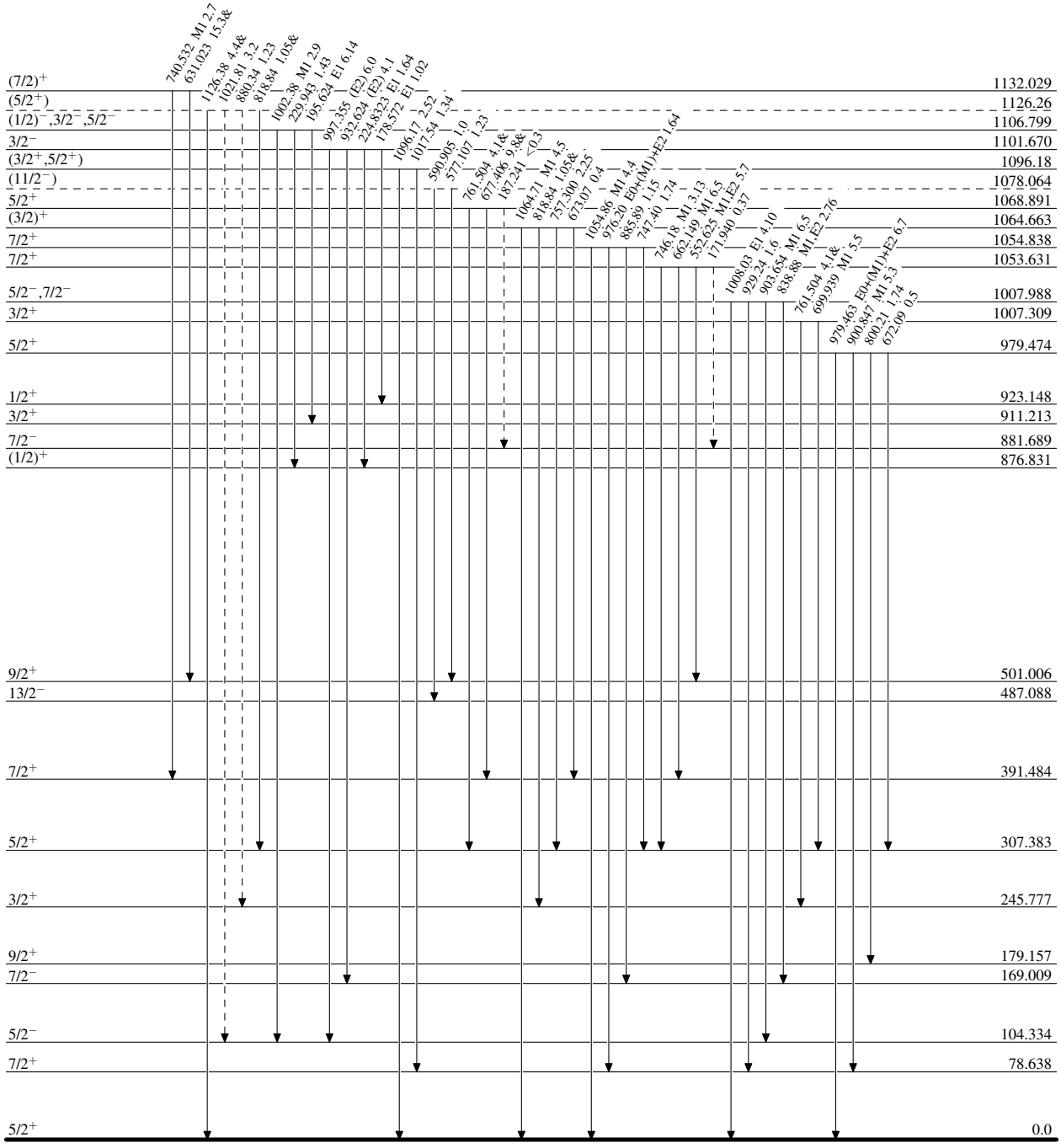
$I_\gamma < 10\% \times I_\gamma^{max}$

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

γ Decay (Uncertain)

Level Scheme (continued)

Intensities: Iγ per 1000 N captures for the secondary γ's. For the primary transitions, the values are relative ones only. Transitions, the values are relative ones only.
& Multiply placed: undivided intensity given

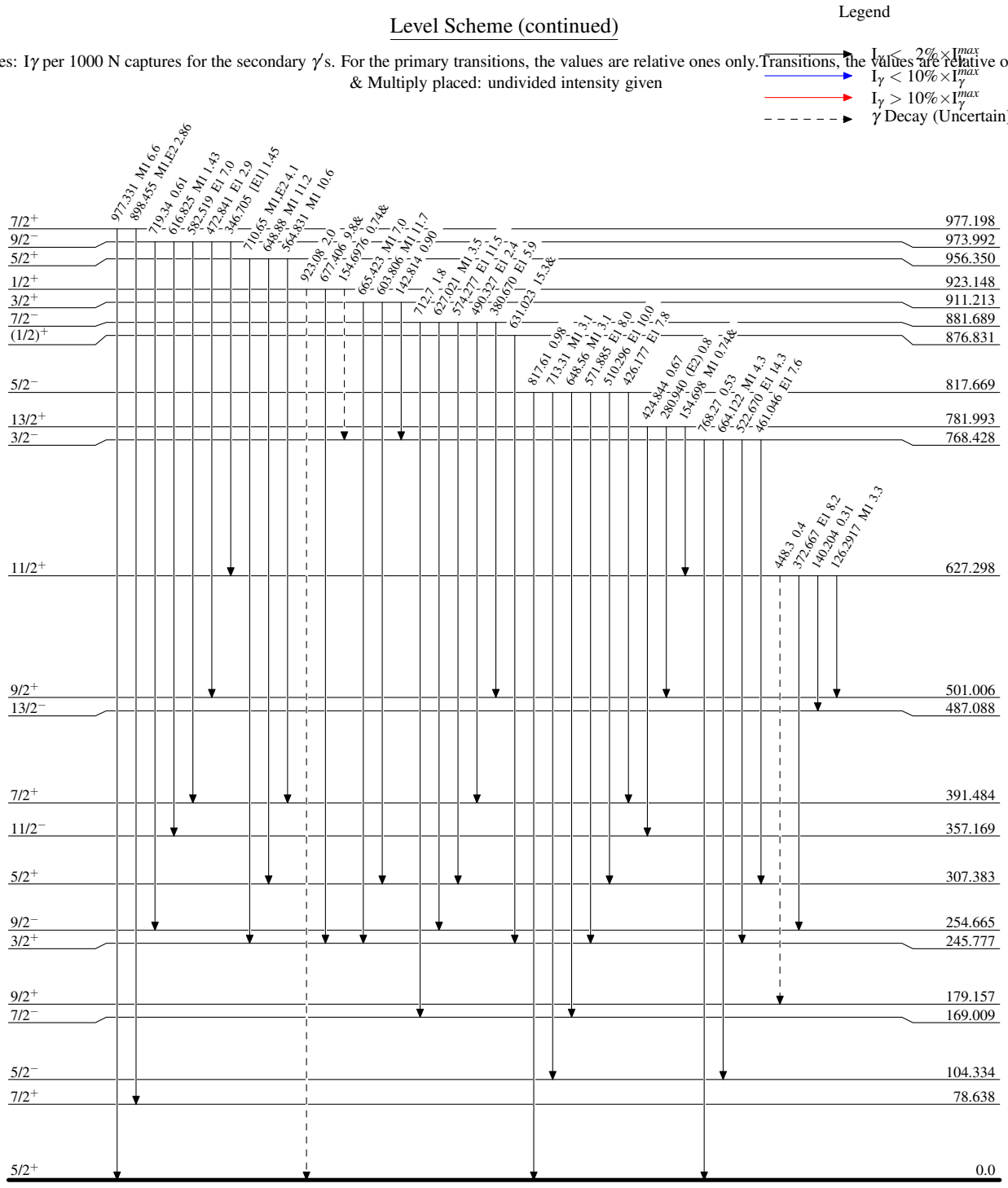


$^{155}_{63}Eu_{92}$

^{153}Eu(2n,γ) 1986Pr03

Level Scheme (continued)

Intensities: Iγ per 1000 N captures for the secondary γ's. For the primary transitions, the values are relative ones only.Transitions, the values are relative ones only.
& Multiply placed: undivided intensity given

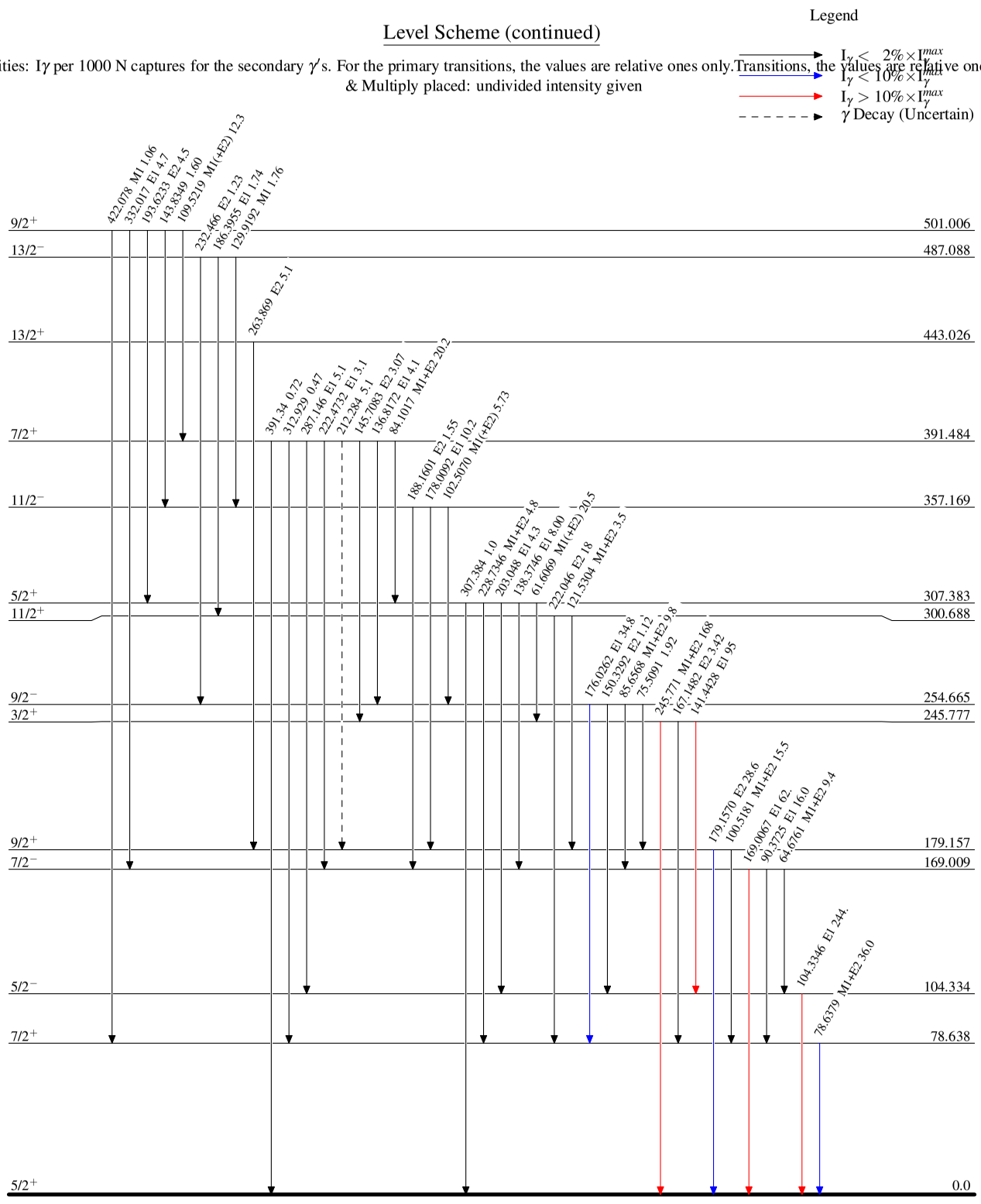


$^{155}_{63}Eu_{92}$

^{153}Eu(2n,γ) 1986Pr03

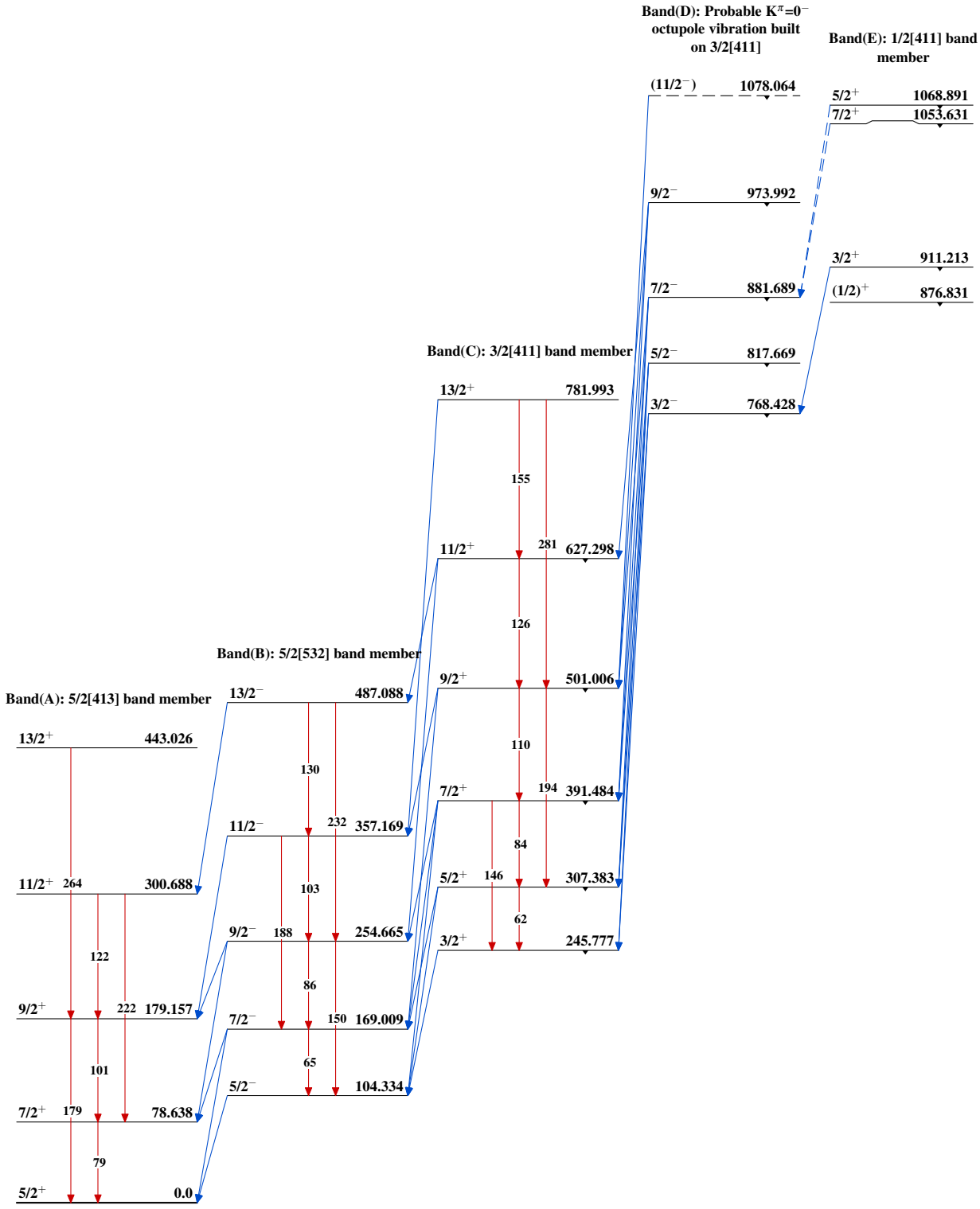
Level Scheme (continued)

Intensities: Iγ per 1000 N captures for the secondary γ's. For the primary transitions, the values are relative ones only.Transitions, the values are relative ones only.
& Multiply placed: undivided intensity given



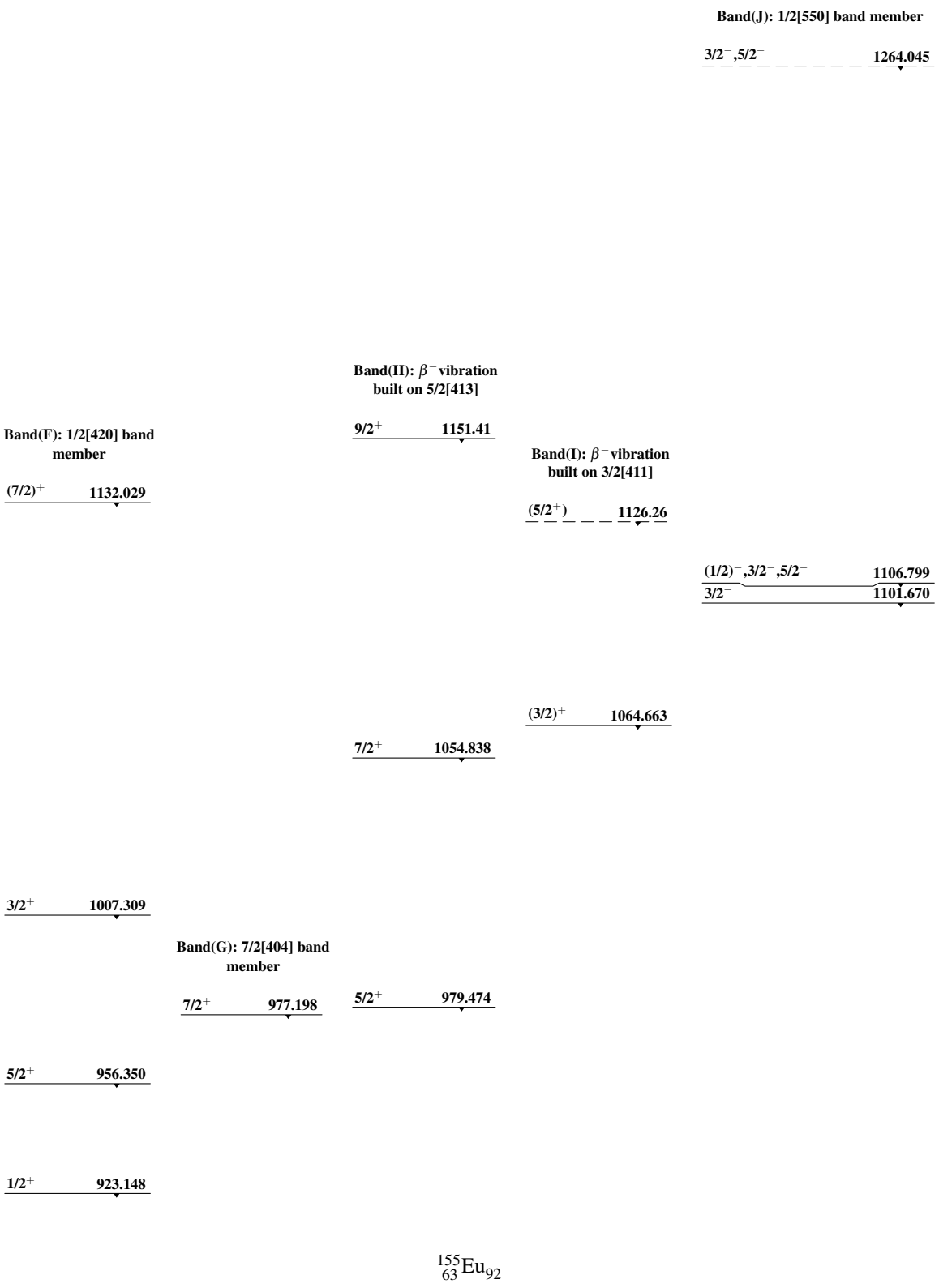
$^{155}_{63}Eu_{92}$

^{153}Eu(2n,γ) 1986Pr03



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

^{153}Eu(2n,γ) 1986Pr03 (continued)



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

^{153}Eu(2n,γ) 1986Pr03 (continued)

Band(L): 3/2[422] band member ?

7/2$^+$ 1632.56

(5/2$^+$) 1548.58

3/2$^+$ 1483.04

Band(K): 5/2[402] band member

5/2$^-$,7/2,9/2$^-$ 1315.94

5/2$^+$ 1230.776

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