^{187}Ir $\varepsilon+\beta^+$ decay 1972Ah05,1971Ma24,1976BaYI

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 110,999 (2009)	1-Nov-2008

Parent: ^{187}Ir: E=0.0; J$^\pi$=3/2$^+$; $T_{1/2}$=10.5 h *3*; Q(ε)=1502 *6*; %ε+%β^+ decay=100

^{187}Os Levels

E(level)†	J$^\pi$‡	$T_{1/2}$#	E(level)†	J$^\pi$‡
0.0	1/2⁻		556.88 *8*	(9/2⁺)
9.766 *19*	3/2⁻	2.38 ns *18*	586.31 *4*	5/2⁻
74.348 *21*	3/2⁻		596.38 *6*	1/2⁻,3/2⁻
75.002 *22*	5/2⁻	2.16 ns *16*	664.19 *5*	(3/2⁻,5/2⁻)
100.45 *4*	7/2⁻	112 ns *6*	711.29 *6*	5/2⁻
187.42 *3*	5/2⁻		725.76 *4*	3/2⁻
190.56 *6*	7/2⁻		935.04 *6*	5/2⁻,7/2⁻
257.11 *7*	11/2⁺		941.82 *7*	(5/2⁺,7/2⁻)
333.26 *5*	(7/2⁻)		987.30 *4*	3/2⁻
445.09 *7*	(7/2⁻,9/2⁻)		1090.30 *5*	(5/2⁻)
501.44 *3*	3/2⁻		1112.18 *5*	1/2⁻,3/2⁻

† From a least-squares adjustment to the γ-ray energies.
‡ From Adopted Levels.
# From γ-ce coincidence measurements (1971Ma24).

ε,β^+ radiations

E(decay)	E(level)	Iβ⁺ †	Iε†	Log *ft*	I(ε+β⁺)†	Comments
(390 *6*)	1112.18		≈1.6	≈6.8		εK=0.7656 *12*; εL=0.1766 *9*; εM+=0.0579 *4*
(412 *6*)	1090.30		≈1.0	≈7.0		εK=0.7694 *11*; εL=0.1738 *8*; εM+=0.0568 *3*
(515 *6*)	987.30		≈13	≈6.1		εK=0.7825 *6*; εL=0.1643 *5*; εM+=0.05317 *17*
(560 *6*)	941.82		≈0.7	≈7.5		εK=0.7865 *5*; εL=0.1614 *4*; εM+=0.05206 *14*
(567 *6*)	935.04		≈0.5	≈7.6		εK=0.7870 *5*; εL=0.1611 *4*; εM+=0.05192 *13*
(776 *6*)	725.76		1.05 *5*	7.62 *3*		εK=0.7984 *3*; εL=0.15284 *17*; εM+=0.04880 *7*
(791 *6*)	711.29		4.58 *16*	6.996 *21*		εK=0.7989 *3*; εL=0.15245 *16*; εM+=0.04865 *6*
(838 *6*)	664.19		0.63 *10*	7.91 *7*		εK=0.8005 *2*; εL=0.1513 *2*; εM+=0.04821 *6*
(906 *6*)	596.38		0.19 *3*	8.51 *7*		εK=0.8025 *2*; εL=0.1498 *2*; εM+=0.04766 *5*
(916 *6*)	586.31		3.33 *14*	7.272 *23*		εK=0.8028 *2*; εL=0.1496 *2*; εM+=0.04759 *5*
(1001 *6*)	501.44		11.4 *3*	6.820 *18*		εK=0.8048 *2*; εL=0.1482 *1*; εM+=0.04703 *4*
(1311 *6*)	190.56		0.19 *5*	9.62^1u *12*		εK=0.7917 *2*; εL=0.1576 *2*; εM+=0.05068 *5*
(1315 *6*)	187.42		5.5 *4*	7.39 *4*		εK=0.8098; εL=0.14448 *6*; εM+=0.04564 *2*
(1427 *6*)	75.002	≈0.0087	≈20	≈6.9	≈20	av Eβ=201.6 *28*; εK=0.8108; εL=0.14353 *5*; εM+=0.04528 *2*
(1428 *6*)	74.348	≈0.0044	≈10.0	≈7.2	≈10	av Eβ=201.9 *28*; εK=0.8108; εL=0.14352 *5*; εM+=0.04528 *2*
(1492 *6*)	9.766	≈0.020	≈24	≈6.9	≈24	av Eβ=231.0 *27*; εK=0.8111; εL=0.14301 *5*; εM+=0.04509 *2* I(ε+β⁺): for log *ft*=7.16 from the analogous transition in ^{189}Ir ε decay, I(γ+ce)=12. The total β feeding to the ground state and 9.8 level have been divided on the the basis of systematics. See comment on β feeding 9.8 level.
(1502 *6*)	0.0	≈0.0018	≈2.0	≈7.9	≈2	av Eβ=235.4 *27*; εK=0.8111; εL=0.14294 *5*; εM+=0.04507 *2* I(ε+β⁺): combined feeding to ground state and 9.8 level

Continued on next page (footnotes at end of table)

^{187}Ir $\varepsilon+\beta^+$ decay 1972Ah05,1971Ma24,1976BaYI (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Comments
		is≈26% from Os K x-ray intensity (1972Ah05) corrected for internal conversion. For log *ft*=8.3 from the analogous transition in ^{189}Ir ε decay, I($\varepsilon+\beta^+$)≈1. See comment on β feeding 9.8 level.

† Absolute intensity per 100 decays.

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Iγ normalization: normalized assuming I(γ+ce) feeding the ground state and 9.8 level is≈74. The $\varepsilon+\beta^+$ feeding to the first two state was estimated to be≈26 by 1972Ah05 on the basis of K x-ray intensities (unreported) corrected for internal conversion.

E_γ[†]	I_γ[‡b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[a]	δ	α[c]	Comments
9.75 *3*	≈15[#]	9.766	3/2⁻	0.0	1/2⁻	M1(+E2)	<0.04	2.8×10^2 *7*	α(M)=2.2×10^2 *5*; α(N+..)=62 *14* α(N)=53 *12*; α(O)=8.8 *18*; α(P)=0.524 *9* Mult.: M1:M2:M3=1680 *504*:154 *48*:<34 (1971Ma24). I$_\gamma$: adjusted for β feeding to the 9.8 level by the evaluator. The value derived from ce data of 1962Ha24 is Iγ=9 *3*. That value is presumed to be low in analogy with the value derived for the 25.6-keV transition.
25.62 *5*	12.4[#] *calc*	100.45	7/2⁻	75.002	5/2⁻	M1+E2	0.021 *8*	54.5 *14*	α(L)=42.0 *11*; α(M)=9.68 *25*; α(N+..)=2.80 *7* α(N)=2.36 *6*; α(O)=0.406 *10*; α(P)=0.0295 *5* Mult.: M1:M2:M3=360 *38*:36 *11*:<14 (1971Ma24), L1:L2:L3:M:N=245:36:7:91:27 (1962Ha24). I$_\gamma$: calculated by the evaluator assuming intensity balance through the 100.4 level. Iγ=8.8 (1962Ha24) and Iγ=22 (1971Ma24). The latter value gives large β feeding to the 100.4 level and is rejected by the evaluator. The former value does not balance feeding through the 100.4 level.
64.59 *3*	≈65	74.348	3/2⁻	9.766	3/2⁻	M1+E2	0.13 *2*	3.91 *15*	α(L)=3.01 *11*; α(M)=0.70 *3*; α(N+..)=0.201 *8* α(N)=0.170 *7*; α(O)=0.0288 *10*; α(P)=0.00191 *3* Mult.: L1:L2:L3=94 *14*:15 *3*:6.7 *14* (1971Ma24), L1:L2:L3=118:19:12 (1962Ha24). I$_\gamma$: adjusted for β feeding to the 9.8 level. Iγ=25 (1971Ma24) and Iγ=51 (1962Ha24), both deduced from ce and α data. See comment on β feeding at the 9.8 level.
65.31 *3*	≈57	75.002	5/2⁻	9.766	3/2⁻	M1+E2	2.9 *3*	24.4 *7*	α(L)=18.4 *5*; α(M)=4.70 *13*; α(N+..)=1.29 *4* α(N)=1.12 *3*; α(O)=0.165 *5*; α(P)=0.00043 *4* Mult.: L1:L2:L3=25 *8*:427 *38*:480 (1971Ma24), L1:L2:L3:M:N=≈14:562:562:288:78 (1962Ha24). I$_\gamma$: from 1962Ha24. Other: Iγ=30 (1971Ma24).
74.30 *3*	≈110	74.348	3/2⁻	0.0	1/2⁻	M1+E2	0.08 *3*	≈9.7	α(L)=1.85 *6*; α(M)=0.426 *6*; α(N)=0.104 *4*; α(O)=0.0178 *6*; α(P)=0.00128 *2* Mult.: L1:L2:L3=125 *19*:11 *3*:<9.6 (1971Ma24), L1:L2:L3:M:N=216:23:7:55:14 (1962Ha24). α: deduced by the evaluator from N$_\gamma$+N$_{cc}$=10,700 and N$_\gamma$=1000, calculated intensities in 1962Ha24. Eγ close to ^{187}Os K-shell binding energy; total α from sub-shells except K using Bricc (2008Ki07) yields 2.4.

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γ(^{187}Os) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [a]	δ	α [c]	Comments
75.03 *3*	≈48	75.002	5/2⁻	0.0	1/2⁻	E2		14.62	I_γ: adjusted for β feeding to the 9.8 level. Iγ=146 (1962Ha24) and Iγ=50 (1971Ma24). α(K)=0.804 *12*; α(L)=10.42 *15*; α(M)=2.67 *4*; α(N+..)=0.732 *11* α(N)=0.638 *9*; α(O)=0.0937 *14*; α(P)=0.0001714 *24* Mult.: L1:L2:L3=<7.2:142 *36*:158 *14* (1971Ma24), L2:L3:M:N=≈245:236:130:35 (1962Ha24).
84.88 *5*	7.2 *8*	586.31	5/2⁻	501.44	3/2⁻	M1		8.99	I_γ: from 1962Ha24. Other value: Iγ=21 (1971Ma24). α(K)=7.42 *11*; α(L)=1.216 *18*; α(M)=0.279 *4*; α(N+..)=0.0808 *12* α(N)=0.0681 *10*; α(O)=0.01176 *17*; α(P)=0.000874 *13* Mult.: ce(L3)<4.8 (1971Ma24), ce(L1)≈7 (1962Ha24).
87.62 *10*	3 *2*	187.42	5/2⁻	100.45	7/2⁻	(M1+E2)	0.4 *1*	8.12 *13*	α(K)=6.0 *4*; α(L)=1.64 *25*; α(M)=0.40 *7*; α(N+..)=0.112 *18* α(N)=0.096 *16*; α(O)=0.0155 *22*; α(P)=0.00070 *5* I_γ: deduced from ce(K)=20 *12* by the evaluator. In 1971Ma24, Iγ<0.3 which is inconsistent with ce measurements. Mult.: K:L1:L2:L3=20 *12*:<0.0:<3.8:<3.8 (1971Ma24), ce(L1)≈7 (1962Ha24). δ: Estimated by the evaluator.
90.37 *10*	0.51	100.45	7/2⁻	9.766	3/2⁻	E2		6.61	α(K)=0.891 *13*; α(L)=4.31 *7*; α(M)=1.103 *17*; α(N+..)=0.303 *5* α(N)=0.264 *4*; α(O)=0.0389 *6*; α(P)=0.0001071 *16* Mult.: K:L1:L2:L3=<19:<0.4:<3.8:<3.8 (1971Ma24), L2:L3=1:1 (1962Ha24).
112.35 *10*	2.59 *24*	187.42	5/2⁻	75.002	5/2⁻	E2		2.73	α(K)=0.660 *10*; α(L)=1.565 *23*; α(M)=0.400 *6*; α(N+..)=0.1101 *16* α(N)=0.0958 *14*; α(O)=0.01418 *21*; α(P)=6.37×10⁻⁵ *9* Mult.: L1:L3=<1.2:1.5 *4* (1971Ma24), L2:L3=≈2.9:≈3.6 (1962Ha24).
113.20 *10*	13.8 *9*	187.42	5/2⁻	74.348	3/2⁻	M1+E2	1.5 *2*	3.05 *10*	α(K)=1.45 *17*; α(L)=1.21 *7*; α(M)=0.305 *18*; α(N+..)=0.084 *5* α(N)=0.073 *5*; α(O)=0.0111 *6*; α(P)=0.000160 *21* Mult.: K:L1:L2:L3=24 *14*:6.2 *14*:12.0 *14*:8.6 *14* (1971Ma24), K:L1:L2:L3:M=22:≈2:12:9:5 (1962Ha24).
115.67 *8*	3.6 *5*	190.56	7/2⁻	75.002	5/2⁻	M1+E2	1.3 +*8*−*4*	2.91 *24*	α(K)=1.5 *5*; α(L)=1.04 *17*; α(M)=0.26 *5*; α(N+..)=0.073 *12* α(N)=0.063 *11*; α(O)=0.0096 *15*; α(P)=0.00017 *6* Mult.: ce(L1)=2.4 *10* (1971Ma24), ce(K)=5.8 (1962Ha24).
146.19 *9*	2.3 *3*	333.26	(7/2⁻)	187.42	5/2⁻	[M1,E2]		1.5 *5*	α(K)=1.0 *6*; α(L)=0.36 *11*; α(M)=0.09 *4*; α(N+..)=0.025 *9* α(N)=0.022 *8*; α(O)=0.0034 *10*; α(P)=0.00011 *8*
156.63 *7*	3.4 *3*	257.11	11/2⁺	100.45	7/2⁻	M2+E3	0.31 *4*	9.53	α(K)=6.47 *16*; α(L)=2.31 *10*; α(M)=0.58 *3*; α(N+..)=0.166 *7* α(N)=0.142 *7*; α(O)=0.0233 *9*; α(P)=0.00121 *3* Mult.: K:L1:L2:L3=32 *8*:11.0 *14*:3.1 *9*:4.3 *14* (1971Ma24), K:L3=18:≈0.9 (1962Ha24).
162.80 *15*	7.3 *7*	664.19	(3/2⁻,5/2⁻)	501.44	3/2⁻	M1		1.403	α(K)=1.160 *17*; α(L)=0.188 *3*; α(M)=0.0430 *7*;

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γ(^{187}Os) (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[a]	δ	α[c]	Comments
									α(N+..)=0.01245 *18* α(N)=0.01051 *15*; α(O)=0.00181 *3*; α(P)=0.0001351 *20* Mult.: K/L=8.9/1.2.
^{x}163.40 *10*	5.1 *5*					M1		1.389	α(K)=1.148 *17*; α(L)=0.186 *3*; α(M)=0.0426 *6*; α(N+..)=0.01233 *18* α(N)=0.01040 *15*; α(O)=0.00180 *3*; α(P)=0.0001337 *19* Mult.: ce(K)=5.2 (1962Ha24).
177.68 *7*	169 *6*	187.42	5/2$^-$	9.766	3/2$^-$	M1+E2	0.53 *6*	0.97 *3*	α(K)=0.76 *3*; α(L)=0.159 *4*; α(M)=0.0375 *9*; α(N+..)=0.01071 *23* α(N)=0.00911 *21*; α(O)=0.00151 *3*; α(P)=8.7×10^{-5} *4* Mult.: K:L1:L2:L3=139 *14*:24.0 *24*:6.2 *14*:4.3 *9* (1971Ma24), K:L1:L2:L3:M=135:23:≈5:2.7:<105 (1962Ha24).
180.83 *11*	13.0 *12*	190.56	7/2$^-$	9.766	3/2$^-$	E2		0.469	α(K)=0.220 *4*; α(L)=0.188 *3*; α(M)=0.0476 *7*; α(N+..)=0.01317 *19* α(N)=0.01143 *17*; α(O)=0.001721 *25*; α(P)=2.03×10^{-5} *3* Mult.: K:L2:L3=3.6:1.5:1.1 (1962Ha24).
^{x}181.85 *15*	2.3 *5*					M1+E2	0.8 *+7−5*	0.81 *18*	α(K)=0.60 *20*; α(L)=0.155 *15*; α(M)=0.037 *5*; α(N+..)=0.0106 *12* α(N)=0.0090 *11*; α(O)=0.00146 *11*; α(P)=6.8×10^{-5} *25* Mult.: ce(K)=1.4 (1962Ha24).
187.37 *7*	114 *4*	187.42	5/2$^-$	0.0	1/2$^-$	E2		0.415	α(K)=0.201 *3*; α(L)=0.1617 *23*; α(M)=0.0408 *6*; α(N+..)=0.01131 *16* α(N)=0.00982 *14*; α(O)=0.001480 *21*; α(P)=1.86×10^{-5} *3* Mult.: ce(K)=23 *3* (1971Ma24), K:L2:L3:M=23:<15:7:<9.
^{x}198.60 *10*	5.34 *25*					M1		0.804	α(K)=0.665 *10*; α(L)=0.1071 *15*; α(M)=0.0246 *4*; α(N+..)=0.00711 *10* α(N)=0.00600 *9*; α(O)=0.001036 *15*; α(P)=7.72×10^{-5} *11* Mult.: ce(K)≈3.2 (1962Ha24).
^{x}206.4 *3*	0.4 *1*					M1		0.722	α(K)=0.598 *9*; α(L)=0.0962 *14*; α(M)=0.0221 *4*; α(N+..)=0.00639 *10* α(N)=0.00539 *8*; α(O)=0.000930 *14*; α(P)=6.94×10^{-5} *11* Mult.: ce(K)=0.39 (1962Ha24).
^{x}211.96 *15*	0.59 *10*								
224.44 *9*	3.03 *15*	725.76	3/2$^-$	501.44	3/2$^-$	M1		0.572	α(K)=0.474 *7*; α(L)=0.0761 *11*; α(M)=0.01746 *25*; α(N+..)=0.00505 *7* α(N)=0.00426 *6*; α(O)=0.000736 *11*; α(P)=5.49×10^{-5} *8* Mult.: ce(K)≈2.
^{x}232.38 *15*	1.02 *10*								
252.99 *9*	4.1 *6*	586.31	5/2$^-$	333.26	(7/2$^-$)	M1		0.412	α(K)=0.341 *5*; α(L)=0.0546 *8*; α(M)=0.01252 *18*; α(N+..)=0.00363 *5* α(N)=0.00306 *5*; α(O)=0.000528 *8*; α(P)=3.94×10^{-5} *6* Mult.: ce(K)=1.7.
258.65 *7*	15.2 *8*	333.26	(7/2$^-$)	74.348	3/2$^-$	(E2)		0.1437	α(K)=0.0866 *13*; α(L)=0.0433 *6*; α(M)=0.01079 *16*; α(N+..)=0.00301 *5*

γ(^{187}Os) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [a]	α [c]	Comments
								α(N)=0.00260 *4*; α(O)=0.000400 *6*; α(P)=8.48×10^{-6} *12* Mult.: K:L1=<9.2:0.9.
261.58 *7*	12.2 *7*	987.30	3/2$^-$	725.76	3/2$^-$	M1	0.376	α(K)=0.311 *5*; α(L)=0.0498 *7*; α(M)=0.01142 *16*; α(N+..)=0.00331 *5* α(N)=0.00279 *4*; α(O)=0.000482 *7*; α(P)=3.60×10^{-5} *5* Mult.: ce(K)=4.6.
265.97 *8*	5.1 *3*	711.29	5/2$^-$	445.09	(7/2$^-$,9/2$^-$)	E2	0.1318	α(K)=0.0806 *12*; α(L)=0.0388 *6*; α(M)=0.00967 *14*; α(N+..)=0.00270 *4* α(N)=0.00233 *4*; α(O)=0.000359 *5*; α(P)=7.93×10^{-6} *12* Mult.: ce(K)=0.8.
275.91 *16*	2.5 *6*	987.30	3/2$^-$	711.29	5/2$^-$	M1	0.325	α(K)=0.269 *4*; α(L)=0.0430 *6*; α(M)=0.00986 *14*; α(N+..)=0.00285 *4* α(N)=0.00241 *4*; α(O)=0.000416 *6*; α(P)=3.11×10^{-5} *5* Mult.: ce(K)=0.7.
[x]277.30 *20*	4.0 *6*							
299.69 *12*	13.7 *7*	556.88	(9/2$^+$)	257.11	11/2$^+$	M1	0.259	α(K)=0.215 *3*; α(L)=0.0343 *5*; α(M)=0.00786 *11*; α(N+..)=0.00228 *4* α(N)=0.00192 *3*; α(O)=0.000332 *5*; α(P)=2.48×10^{-5} *4* Mult.: K/L1=3.6/0.5.
314.13 *8*	57.4 *20*	501.44	3/2$^-$	187.42	5/2$^-$	M1	0.228	α(K)=0.189 *3*; α(L)=0.0302 *5*; α(M)=0.00691 *10*; α(N+..)=0.00200 *3* α(N)=0.001687 *24*; α(O)=0.000292 *4*; α(P)=2.18×10^{-5} *3* Mult.: K/L1=14.4/2.3.
323.11[d] *9*	[@d]	333.26	(7/2$^-$)	9.766	3/2$^-$	(E2)	0.0734	α(K)=0.0489 *7*; α(L)=0.0187 *3*; α(M)=0.00460 *7*; α(N+..)=0.001287 *18* α(N)=0.001109 *16*; α(O)=0.0001733 *25*; α(P)=4.96×10^{-6} *7* Mult.: ce(K)≈0.004 (1962Ha24).
323.11[d] *9*	17.1[@d] *6*	987.30	3/2$^-$	664.19	(3/2$^-$,5/2$^-$)			
344.34 *9*	3.0 *3*	445.09	(7/2$^-$,9/2$^-$)	100.45	7/2$^-$	M1	0.1782	α(K)=0.1477 *21*; α(L)=0.0235 *4*; α(M)=0.00538 *8*; α(N+..)=0.001558 *22* α(N)=0.001314 *19*; α(O)=0.000227 *4*; α(P)=1.700×10^{-5} *24* Mult.: ce(K)=0.63.
348.74 *9*	2.77 *23*	935.04	5/2$^-$,7/2$^-$	586.31	5/2$^-$	M1	0.1722	α(K)=0.1428 *20*; α(L)=0.0227 *4*; α(M)=0.00520 *8*; α(N+..)=0.001506 *22* α(N)=0.001270 *18*; α(O)=0.000219 *3*; α(P)=1.643×10^{-5} *23* Mult.: ce(K)=0.7.
355.69 *10*	2.26 *21*	941.82	(5/2$^+$,7/2$^-$)	586.31	5/2$^-$			
[x]370.70 *10*	4.6 *3*					M1	0.1462	α(K)=0.1213 *17*; α(L)=0.0193 *3*; α(M)=0.00441 *7*; α(N+..)=0.001276 *18* α(N)=0.001076 *15*; α(O)=0.000186 *3*; α(P)=1.394×10^{-5} *20* Mult.: ce(K)=0.8 (1962Ha24).
[x]377.12 *20*	3.5 *5*							
384.96 *8*	19.0 *22*	941.82	(5/2$^+$,7/2$^-$)	556.88	(9/2$^+$)			
395.89 *11*	9.09 *20*	586.31	5/2$^-$	190.56	7/2$^-$	M1	0.1227	α(K)=0.1018 *15*; α(L)=0.01613 *23*; α(M)=0.00369 *6*;

$^{187}_{76}$Os$_{111}$-6

$\gamma(^{187}Os)$ (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[a]	α[c]	Comments
								α(N+..)=0.001069 *15* α(N)=0.000902 *13*; α(O)=0.0001559 *22*; α(P)=1.169×10^{-5} *17* Mult.: K/L=1.1/≈0.2.
398.72 *23*	24.3 *23*	586.31	5/2$^-$	187.42	5/2$^-$	M1	0.1204	α(K)=0.0999 *14*; α(L)=0.01583 *23*; α(M)=0.00362 *6*; α(N+..)=0.001049 *15* α(N)=0.000885 *13*; α(O)=0.0001529 *22*; α(P)=1.147×10^{-5} *17* Mult.: K/L1=2.7/0.4.
400.81[d] *9*	270[#d] *9*	501.44	3/2$^-$	100.45	7/2$^-$	E2	0.0402	α(K)=0.0287 *4*; α(L)=0.00878 *13*; α(M)=0.00214 *3*; α(N+..)=0.000601 *9* α(N)=0.000516 *8*; α(O)=8.20×10^{-5} *12*; α(P)=2.99×10^{-6} *5* Mult.: K:L2:L3:M=9.6:2:0.4:0.6.
400.81[de] *9*	[#d]	987.30	3/2$^-$	586.31	5/2$^-$			
^{x}412.20 *10*	10.0 *13*							
^{x}422.30 *15*	3.2 *3*							
426.4 *8*	17 *3*	501.44	3/2$^-$	75.002	5/2$^-$	[M1,E2]	0.07 *4*	α(K)=0.05 *3*; α(L)=0.010 *3*; α(M)=0.0024 *7*; α(N+..)=0.00068 *20* α(N)=0.00058 *16*; α(O)=0.00010 *3*; α(P)=6.E−6 *4*
427.02 *8*	282 *9*	501.44	3/2$^-$	74.348	3/2$^-$	M1	0.1004	α(K)=0.0833 *12*; α(L)=0.01317 *19*; α(M)=0.00301 *5*; α(N+..)=0.000873 *13* α(N)=0.000736 *11*; α(O)=0.0001273 *18*; α(P)=9.55×10^{-6} *14* Mult.: K/L1=≈25/≈4.
440.27 *9*	4.0 *5*	941.82	(5/2$^+$,7/2$^-$)	501.44	3/2$^-$			
448.20 *8*	8.5 *4*	1112.18	1/2$^-$,3/2$^-$	664.19	(3/2$^-$,5/2$^-$)	M1	0.0883	α(K)=0.0733 *11*; α(L)=0.01158 *17*; α(M)=0.00265 *4*; α(N+..)=0.000767 *11* α(N)=0.000647 *9*; α(O)=0.0001118 *16*; α(P)=8.40×10^{-6} *12* Mult.: K/L1=0.8/0.1.
456.74 *19*	2.8 *6*	556.88	(9/2$^+$)	100.45	7/2$^-$	[E1]	0.00933	α(K)=0.00779 *11*; α(L)=0.001186 *17*; α(M)=0.000270 *4*; α(N+..)=7.73×10^{-5} *11* α(N)=6.55×10^{-5} *10*; α(O)=1.111×10^{-5} *16*; α(P)=7.58×10^{-7} *11*
485.96 *7*	48.7 *18*	586.31	5/2$^-$	100.45	7/2$^-$	E2	0.0244	α(K)=0.0183 *3*; α(L)=0.00472 *7*; α(M)=0.001135 *16*; α(N+..)=0.000321 *5* α(N)=0.000275 *4*; α(O)=4.43×10^{-5} *7*; α(P)=1.94×10^{-6} *3* Mult.: ce(K)=1.3.
491.74 *7*	87 *3*	501.44	3/2$^-$	9.766	3/2$^-$	M1	0.0692	α(K)=0.0575 *8*; α(L)=0.00905 *13*; α(M)=0.00207 *3*; α(N+..)=0.000600 *9* α(N)=0.000506 *7*; α(O)=8.74×10^{-5} *13*; α(P)=6.57×10^{-6} *10* Mult.: K:L1:M=0.4:0.8:<1.2.
501.51 *7*	100 *7*	501.44	3/2$^-$	0.0	1/2$^-$	M1	0.0658	α(K)=0.0546 *8*; α(L)=0.00859 *12*; α(M)=0.00197 *3*; α(N+..)=0.000569 *8* α(N)=0.000480 *7*; α(O)=8.30×10^{-5} *12*; α(P)=6.24×10^{-6} *9* Mult.: K/L1=5.6/<1.2.

$\gamma(^{187}Os)$ (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[a]	δ	α[c]	Comments
511.11 *9*	7.7 *13*	586.31	5/2⁻	75.002	5/2⁻				
515.68 *8*	24.7 *11*	1112.18	1/2⁻,3/2⁻	596.38	1/2⁻,3/2⁻	M1		0.0611	α(K)=0.0508 *8*; α(L)=0.00798 *12*; α(M)=0.00183 *3*; α(N+..)=0.000529 *8* α(N)=0.000446 *7*; α(O)=7.71×10^{-5} *11*; α(P)=5.80×10^{-6} *9* Mult.: K/L1=1.5/<2.4.
522.13 *8*	16.9 *8*	596.38	1/2⁻,3/2⁻	74.348	3/2⁻	M1		0.0592	α(K)=0.0492 *7*; α(L)=0.00773 *11*; α(M)=0.001767 *25*; α(N+..)=0.000512 *8* α(N)=0.000431 *6*; α(O)=7.46×10^{-5} *11*; α(P)=5.61×10^{-6} *8* Mult.: ce(K)=1.1.
^{x}564.69 *15*	2.8 *2*								
576.60 *7*	58.2 *21*	586.31	5/2⁻	9.766	3/2⁻	M1		0.0457	α(K)=0.0380 *6*; α(L)=0.00595 *9*; α(M)=0.001361 *19*; α(N+..)=0.000394 *6* α(N)=0.000332 *5*; α(O)=5.75×10^{-5} *8*; α(P)=4.33×10^{-6} *6* Mult.: K/L1=≈2.2/<0.7.
586.39 *8*	20.4 *11*	596.38	1/2⁻,3/2⁻	9.766	3/2⁻	M1		0.0438	α(K)=0.0364 *5*; α(L)=0.00570 *8*; α(M)=0.001302 *19*; α(N+..)=0.000377 *6* α(N)=0.000318 *5*; α(O)=5.50×10^{-5} *8*; α(P)=4.14×10^{-6} *6* Mult.: ce(K)=0.7.
589.47 *8*	19.0 *11*	664.19	(3/2⁻,5/2⁻)	75.002	5/2⁻	M1		0.0432	α(K)=0.0359 *5*; α(L)=0.00562 *8*; α(M)=0.001284 *18*; α(N+..)=0.000372 *6* α(N)=0.000314 *5*; α(O)=5.42×10^{-5} *8*; α(P)=4.09×10^{-6} *6* Mult.: ce(K)=0.5.
610.88 *7*	269 *10*	711.29	5/2⁻	100.45	7/2⁻	M1		0.0394	α(K)=0.0328 *5*; α(L)=0.00512 *8*; α(M)=0.001170 *17*; α(N+..)=0.000339 *5* α(N)=0.000286 *4*; α(O)=4.94×10^{-5} *7*; α(P)=3.73×10^{-6} *6* Mult.: K:L1:M=8.5:1.4:0.4.
636.49 *12*	21 *3*	711.29	5/2⁻	75.002	5/2⁻				
651.40 *8*	29.5 *19*	725.76	3/2⁻	74.348	3/2⁻	M1+E2	0.9 *+7−4*	0.024 *6*	α(K)=0.020 *5*; α(L)=0.0033 *7*; α(M)=0.00076 *14*; α(N+..)=0.00022 *4* α(N)=0.00019 *4*; α(O)=3.2×10^{-5} *7*; α(P)=2.2×10^{-6} *6* Mult.: ce(K)=0.6.
654.30[d] *8*	23[&d] *6*	664.19	(3/2⁻,5/2⁻)	9.766	3/2⁻	M1(+E2)	<0.9	0.028 *5*	α(K)=0.023 *4*; α(L)=0.0038 *6*; α(M)=0.00087 *12*; α(N+..)=0.00025 *4* α(N)=0.00021 *3*; α(O)=3.6×10^{-5} *5*; α(P)=2.6×10^{-6} *5* Mult.: ce(K)=0.004, K/L=0.7/<0.4.
654.30[de] *8*	6[&d] *6*	987.30	3/2⁻	333.26	(7/2⁻)	[E2]		0.01212	α(K)=0.00951 *14*; α(L)=0.00200 *3*; α(M)=0.000473 *7*; α(N+..)=0.0001347 *19* α(N)=0.0001148 *16*; α(O)=1.89×10^{-5} *3*; α(P)=1.019×10^{-6} *15*

$\gamma(^{187}Os)$ (continued)

E_γ[†]	I_γ[‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[a]	δ	α[c]	Comments
664.25 *11*	8.8 *5*	664.19	$(3/2^-,5/2^-)$	0.0	$1/2^-$				
701.2 *10*	4.2 *9*	711.29	$5/2^-$	9.766	$3/2^-$				
711.47 *12*	6.6 *6*	711.29	$5/2^-$	0.0	$1/2^-$				
716.00 *11*	18.3 *10*	725.76	$3/2^-$	9.766	$3/2^-$				
725.70 *8*	34.9 *20*	725.76	$3/2^-$	0.0	$1/2^-$	M1+E2	1.8 *+54−7*	0.013 *4*	α(K)=0.011 *3*; α(L)=0.0019 *4*; α(M)=0.00045 *9*; α(N+..)=0.000129 *25* α(N)=0.000110 *21*; α(O)=1.8×10^{-5} *4*; α(P)=1.2×10^{-6} *4* Mult.: ce(K)=0.4.
[x]742.05 *15*	3.2 *2*								
747.62 *8*	21.8 *14*	935.04	$5/2^-,7/2^-$	187.42	$5/2^-$	M1(+E2)	<1.2	0.019 *5*	α(K)=0.016 *4*; α(L)=0.0026 *5*; α(M)=0.00059 *11*; α(N+..)=0.00017 *4* α(N)=0.00014 *3*; α(O)=2.5×10^{-5} *5*; α(P)=1.8×10^{-6} *5* Mult.: ce(K)=0.4.
756.64 *9*	13.8 *9*	1090.30	$(5/2^-)$	333.26	$(7/2^-)$	M1		0.0227	α(K)=0.0189 *3*; α(L)=0.00294 *5*; α(M)=0.000671 *10*; α(N+..)=0.000194 *3* α(N)=0.0001638 *23*; α(O)=2.84×10^{-5} *4*; α(P)=2.15×10^{-6} *3* Mult.: ce(K)=0.3.
[x]787.99 *10*	4.6 *10*								
796.8 *10*	0.94 *19*	987.30	$3/2^-$	190.56	$7/2^-$				
799.90 *8*	61.0 *25*	987.30	$3/2^-$	187.42	$5/2^-$	M1		0.0197	α(K)=0.01645 *23*; α(L)=0.00255 *4*; α(M)=0.000582 *9*; α(N+..)=0.0001684 *24* α(N)=0.0001420 *20*; α(O)=2.46×10^{-5} *4*; α(P)=1.86×10^{-6} *3* Mult.: K/L1=0.9/0.2.
[x]813.97 *15*	4.6 *6*								
841.09 *20*	20.9 *10*	941.82	$(5/2^+,7/2^-)$	100.45	$7/2^-$				
860.63 *12*	6.0 *4*	935.04	$5/2^-,7/2^-$	74.348	$3/2^-$				
886.91 *9*	8.8 *5*	987.30	$3/2^-$	100.45	$7/2^-$				
899.85 *13*	9.1 *9*	1090.30	$(5/2^-)$	190.56	$7/2^-$				
902.94 *8*	20.2 *10*	1090.30	$(5/2^-)$	187.42	$5/2^-$	M1		0.01453	α(K)=0.01211 *17*; α(L)=0.00187 *3*; α(M)=0.000426 *6*; α(N+..)=0.0001235 *18* α(N)=0.0001041 *15*; α(O)=1.80×10^{-5} *3*; α(P)=1.367×10^{-6} *20* Mult.: ce(K)=0.3.
912.86 *7*	328 *12*	987.30	$3/2^-$	74.348	$3/2^-$	M1		0.01413	α(K)=0.01178 *17*; α(L)=0.00182 *3*; α(M)=0.000415 *6*; α(N+..)=0.0001201 *17* α(N)=0.0001012 *15*; α(O)=1.753×10^{-5} *25*; α(P)=1.330×10^{-6} *19* Mult.: K/L1=3.3/0.6.
935.14 *20*	5.2 *20*	935.04	$5/2^-,7/2^-$	0.0	$1/2^-$				

γ(^{187}Os) (continued)

E_γ [†]	I_γ [‡b]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [a]	δ	α [c]	Comments
977.54 *8*	215 *7*	987.30	3/2$^-$	9.766	3/2$^-$	M1+E2	0.9 *+4−3*	0.0089 *13*	α(K)=0.0074 *11*; α(L)=0.00118 *15*; α(M)=0.00027 *4*; α(N+..)=7.8×10^{-5} *10* α(N)=6.6×10^{-5} *8*; α(O)=1.13×10^{-5} *15*; α(P)=8.2×10^{-7} *13* Mult.: K/L1=1.5/0.3.
987.35 *8*	192 *7*	987.30	3/2$^-$	0.0	1/2$^-$	M1(+E2)	<1	0.0100 *17*	α(K)=0.0083 *14*; α(L)=0.00130 *20*; α(M)=0.00030 *5*; α(N+..)=8.6×10^{-5} *13* α(N)=7.2×10^{-5} *11*; α(O)=1.25×10^{-5} *19*; α(P)=9.3×10^{-7} *17* Mult.: K/L1=1.5/0.3.
[x]1012.50 *20*	2.6 *5*								
1016.05 *20*	6.0 *6*	1090.30	(5/2$^-$)	74.348	3/2$^-$				
1037.96 *10*	26.3 *13*	1112.18	1/2$^-$,3/2$^-$	74.348	3/2$^-$				
1080.60 *9*	8.4 *6*	1090.30	(5/2$^-$)	9.766	3/2$^-$				
1090.5 *1*	1.35 *15*	1090.30	(5/2$^-$)	0.0	1/2$^-$				
1102.22 *9*	11.6 *6*	1112.18	1/2$^-$,3/2$^-$	9.766	3/2$^-$				
1111.99 *19*	34.8 *17*	1112.18	1/2$^-$,3/2$^-$	0.0	1/2$^-$	M1+E2	0.7 *6*	0.0071 *15*	α(K)=0.0059 *13*; α(L)=0.00092 *18*; α(M)=0.00021 *4*; α(N+..)=6.1×10^{-5} *12* α(N)=5.1×10^{-5} *10*; α(O)=8.9×10^{-6} *17*; α(P)=6.6×10^{-7} *15*; α(IPF)=4.1×10^{-7} *6* Mult.: ce(K)=0.2.

[†] Weighted average of 1971Ma24 and 1976BaYI.

[‡] Weighted average of 1971Ma24, 1972Ah05 (20% uncertainty assumed by the evaluator), and 1976BaYI. Iγ for the low γ-rays are by the evaluator based on the total β feeding to the g.s. and 9.8 level (estimated from an indirect measurement by 1972Ah05).

[#] In (n,γ) the 401γ only is assigned as deexciting the 502 level. The branching ratio in (n,γ) was the same as in ^{187}Ir ε decay, consistent with little or no 401γ intensity from the 987 level.

[@] The 323γ is not analyzed in (n,γ) or (p,nγ) despite the fact that the other transitions deexciting the 333 level are strongly populated. Its intensity from the 333 level is presumed negligible with respect to the second placement from the 987 level.

[&] Iγ(654.3)=29.0 *17*. The intensity has been divided using the M1+E2 mixing ratio for the combined transition and assuming that the component deexciting the 987 level is E2.

[a] From conversion electron intensities. The electron intensities are renormalized to the γ-ray scale by the evaluator. ce data is multiplied by 4.8 and 0.144 for the 1971Ma24 and 1962Ha24 data, respectively. Both normalizations assume E2 multipolarity for the 187.4γ. For E>187 keV, ce data from 1962Ha24 are given. For the ce data of 1962Ha24, 20% uncertainty has been assumed for all but approximate values where 50% uncertainty has been assumed.

[b] For absolute intensity per 100 decays, multiply by ≈0.013.

[c] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

[d] Multiply placed with intensity suitably divided.

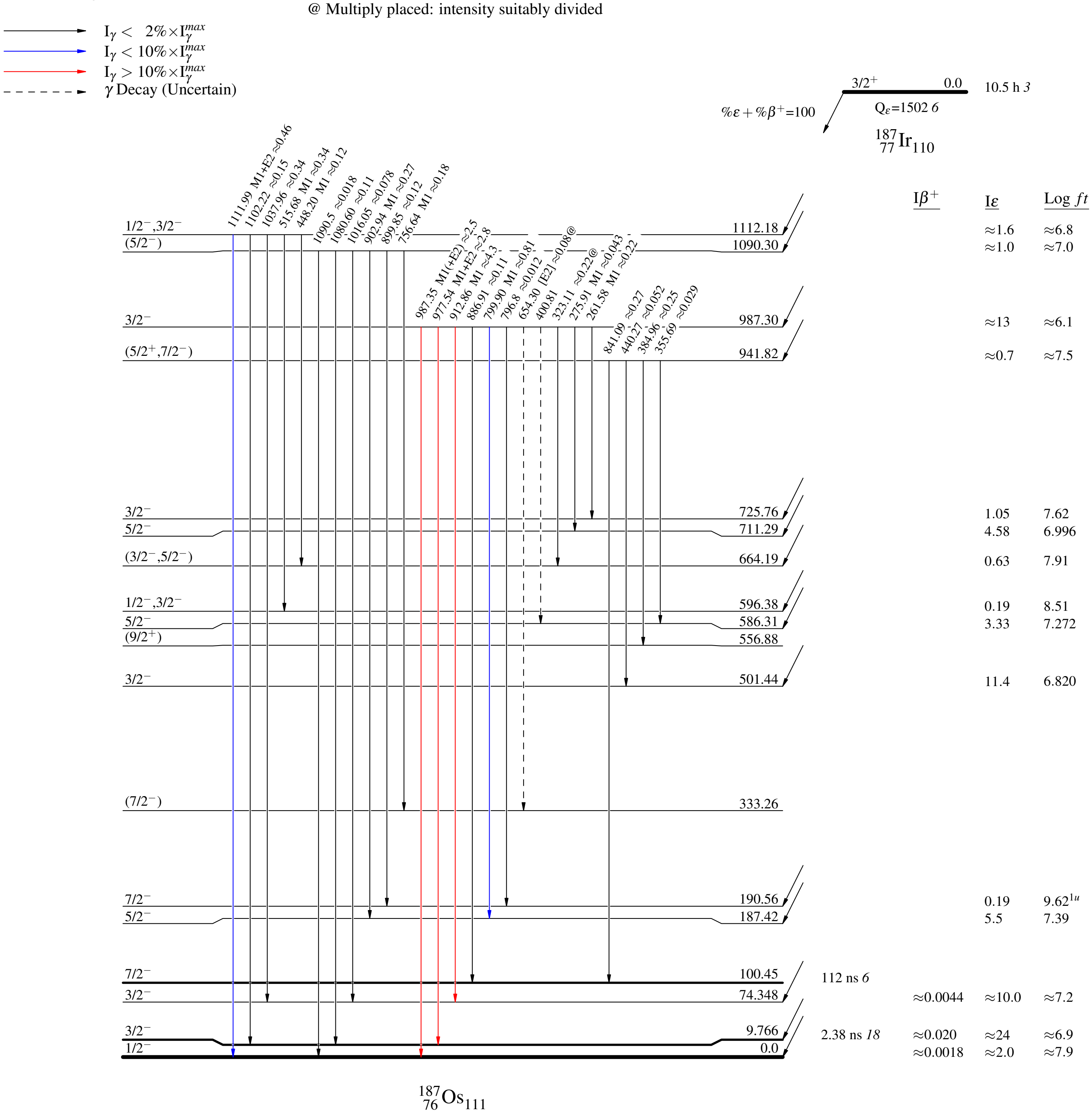
[e] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

^{187}Ir ε decay 1972Ah05,1971Ma24,1976BaYI

Decay Scheme

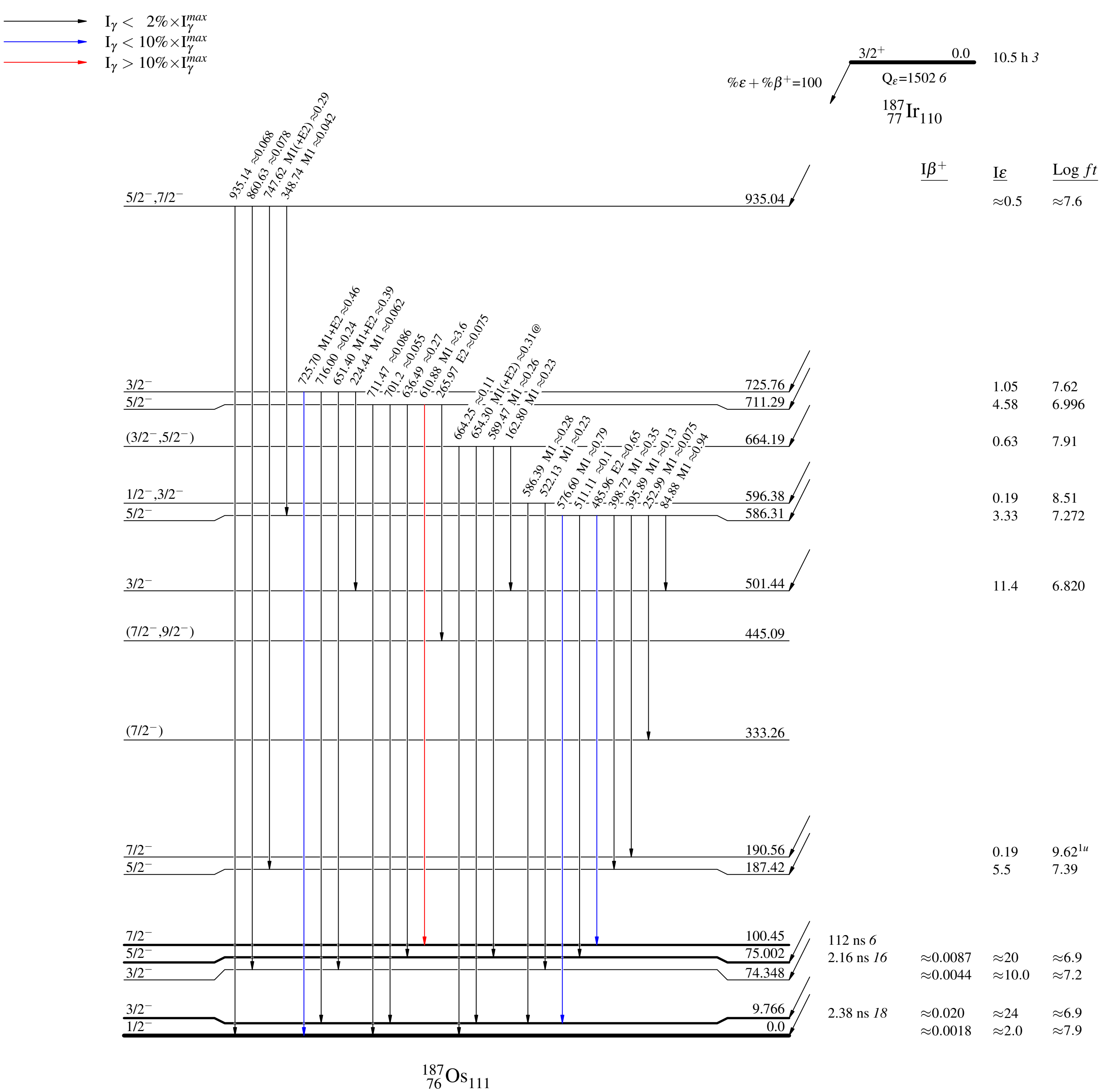
Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



^{187}Ir ε decay 1972Ah05,1971Ma24,1976BaYI

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided



^{187}Ir ε decay 1972Ah05,1971Ma24,1976BaYI

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided