^{136}Xe(^{19}F,4nγ) 1995Jo18

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 110, 1 (2009)	20-Nov-2008

Includes reaction ^{148}Nd(^{7}Li,4nγ) E=40 MeV.

1995Jo18 (also 1992JoZM): E=78 MeV. Measured γ, $\gamma\gamma$, ce, $\gamma\gamma(\theta)$ (DCO ratios, θ=90°, 37°). ce data were measured using ^{148}Nd(^{7}Li,4nγ) at E=40 MeV.

^{151}Eu Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0	5/2$^+$	1503.2 *3*	(23/2)$^-$	2438.2 *3*	(27/2)$^+$	3479.6 *4*	(35/2$^+$)
21.542 *3*	7/2$^+$	1504.6 *2*	(19/2$^-$)	2520.4 *4*	(27/2$^-$)	3498.0 *5*	(35/2)$^-$
196.2 *1*	11/2$^-$	1506.8 *2*	19/2$^+$	2557.2 *5*	(27/2$^+$)	3529.0 *4*	(35/2$^+$)
307.8 *2*	(9/2)$^+$	1563.7 *2*	21/2$^-$	2610.8 *4*	(27/2$^+$)	3544.4 *5*	(37/2$^+$)
350.0 *2*	9/2$^-$	1719.2 *3*	(21/2$^+$)	2636.3 *4*	(29/2$^+$)	3807.1 *7*	(35/2$^+$)
502.1 *2*	15/2$^-$	1732.7 *4*	(21/2$^+$)	2734.8 *4*	(27/2$^+$)	3879.3 *5*	(37/2$^-$)
511.0 *2*	(11/2)$^+$	1752.2 *4*	(19/2$^+$)	2782.6 *3*	(29/2$^-$)	4119.7 *5*	(39/2$^+$)
611.3 *2*	13/2$^-$	1764.8 *4*	(21/2$^+$)	2789.7 *4*	(31/2)$^-$	4126.9 *5*	(39/2)$^-$
698.1 *2*	(11/2$^-$)	1947.8 *3*	(23/2)$^+$	2857.1 *5*	(29/2$^+$)	4140.7 *5*	(39/2$^+$)
752.3 *2*	13/2$^+$	1994.7 *3*	(23/2$^-$)	2923.5# *5*		4185.6 *6*	(41/2$^+$)
957.0 *2*	19/2$^-$	1995.8 *4*	(23/2$^+$)	2955.2 *4*	(31/2)$^+$	4460.9 *5*	(41/2$^-$)
973.2 *2*	(15/2)$^+$	2117.8 *3*	(27/2)$^-$	2990.4 *4*	(31/2$^+$)	4730.5 *6*	(43/2$^-$)
1040.9 *2*	17/2$^-$	2151.7 *3*	25/2$^-$	3046.0 *4*	(33/2)$^+$	4807.9 *6*	(43/2$^+$)
1057.1 *2*	(15/2$^-$)	2170.6 *3*	(25/2$^+$)	3089.1 *5*	(31/2$^-$)	4858.6 *6*	(43/2$^+$)
1113.9 *3*	15/2$^+$	2224.1 *3*	(23/2$^+$)	3092.4 *5*		4968.4 *7*	(45/2$^+$)
1220.6 *2*	(17/2$^+$)	2237.4 *5*	(25/2$^+$)	3163.4 *6*	(31/2$^+$)	5662.4 *7*	(47/2$^+$)
1462.5 *2*	19/2$^+$	2275.6 *3*	(25/2$^+$)	3378.6 *4*	(33/2$^-$)	5776.9 *7*	(49/2$^+$)

† From least-squares fit to Eγ's.

‡ From 'Adopted Levels'. For high-spin states the assignments are primarily based on DCO ratios, selected conversion coefficients, and band associations.

Level taken (evaluator) from 1993Ve04.

γ(^{151}Eu)

E$_\gamma$†	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.‡	α@	Comments
21.542 *3*		21.542	7/2$^+$	0.0	5/2$^+$			E$_\gamma$: from 'adopted gammas'.
59.0 *3*	0.6 *2*	1563.7	21/2$^-$	1504.6	(19/2$^-$)			
84.0 *3*	0.8 *2*	1040.9	17/2$^-$	957.0	19/2$^-$			
109.0 *3*	1.6 *2*	611.3	13/2$^-$	502.1	15/2$^-$	M1	1.442 *24*	α(K)=1.220 *20*; α(L)=0.174 *3*; α(M)=0.0377 *6*; α(N+..)=0.01013 *17* α(N)=0.00863 *14*; α(O)=0.001368 *22*; α(P)=0.0001350 *22* DCO=1.9 *4*. α(K)exp=0.85 *4*, α(L)exp=0.13 *1*. α(K)exp does not indicate M1 since it is less than α(K)(E2) but α(L)exp agrees with M1.
154.0 *3*	1.5 *2*	350.0	9/2$^-$	196.2	11/2$^-$	M1	0.543	α(K)=0.459 *7*; α(L)=0.0653 *10*; α(M)=0.01411 *22*; α(N+..)=0.00380 *6* α(N)=0.00323 *5*; α(O)=0.000513 *8*; α(P)=5.08×10^{-5} *8* DCO=1.8 *4*. α(K)exp=0.41 *2*, α(L)exp=0.059 *8*.
172.6 *3*	0.5 *1*	2610.8	(27/2$^+$)	2438.2	(27/2)$^+$	(M1)	0.395	α(K)=0.335 *5*; α(L)=0.0475 *7*; α(M)=0.01025

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^{136}Xe(^{19}F,4nγ) 1995Jo18 (continued)

γ(^{151}Eu) (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
								16; α(N+..)=0.00276 *4* α(N)=0.00235 *4*; α(O)=0.000373 *6*; α(P)=3.69×10^{-5} *6* DCO=1.5 *7*. α(K)exp(172.6γ+172.8γ)= 0.19 *3*. α(K)exp and DCO ratios are consistent with M1 and E1 for the two components of the doublet.
172.8 *3*	0.8 *2*	2955.2	(31/2)$^+$	2782.6	(29/2$^-$)	(E1)	0.0647	α(K)=0.0549 *8*; α(L)=0.00776 *12*; α(M)=0.001668 *25*; α(N+..)=0.000441 *7* α(N)=0.000378 *6*; α(O)=5.79×10^{-5} *9*; α(P)=4.92×10^{-6} *8* DCO=1.6 *4*. α(K)exp(172.6γ+172.8γ)= 0.19 *3*. α(K)exp and DCO ratios are consistent with M1 and E1 for the two components of the doublet.
174.7 *1*		196.2	11/2$^-$	21.542	7/2$^+$			E_γ: from 'Adopted Levels, gammas'.
203.4 *3*	1.1 *1*	511.0	(11/2)$^+$	307.8	(9/2)$^+$	M1+E2	0.227 *24*	α(K)=0.18 *4*; α(L)=0.038 *8*; α(M)=0.0085 *20*; α(N+..)=0.0022 *5* α(N)=0.0019 *5*; α(O)=0.00028 *5*; α(P)=1.8×10^{-5} *6* DCO=1.2 *2*. α(K)exp=0.14 *2*. α(K)exp gives δ(E2/M1)>2.
220.9 *3*	0.4 *1*	973.2	(15/2)$^+$	752.3	13/2$^+$	M1+E2	0.178 *23*	α(K)=0.14 *3*; α(L)=0.028 *5*; α(M)=0.0063 *12*; α(N+..)=0.0017 *3* α(N)=0.00143 *25*; α(O)=0.00021 *3*; α(P)=1.4×10^{-5} *5* DCO=1.4 *6*. α(K)exp=0.18 *3*. α(K)exp gives δ(E2/M1)<0.8.
241.3 *3*	0.4 *1*	752.3	13/2$^+$	511.0	(11/2)$^+$			DCO=1.2 *2*.
247.5 *3*	1.5 *2*	1220.6	(17/2$^+$)	973.2	(15/2)$^+$	(M1+E2)	0.127 *21*	α(K)=0.102 *23*; α(L)=0.0194 *19*; α(M)=0.0043 *5*; α(N+..)=0.00113 *11* α(N)=0.00097 *11*; α(O)=0.000147 *9*; α(P)=1.0×10^{-5} *4* DCO=1.2 *2*. α(K)exp(247.5γ+247.6γ)= 0.11 *2*. α(K)exp gives δ(E2/M1)<2.
247.6 *3*	0.5 *1*	4126.9	(39/2)$^-$	3879.3	(37/2$^-$)	(M1+E2)	0.127 *21*	α(K)=0.102 *23*; α(L)=0.0193 *19*; α(M)=0.0043 *5*; α(N+..)=0.00113 *11* α(N)=0.00097 *11*; α(O)=0.000146 *9*; α(P)=1.0×10^{-5} *4* α(K)exp(247.5γ+247.6γ)=0.11 *2*. α(K)exp gives δ(E2/M1)<2 for the doublet.
256.2 *1*	7.0 *4*	3046.0	(33/2)$^+$	2789.7	(31/2)$^-$	E1	0.0229	α(K)=0.0195 *3*; α(L)=0.00269 *4*; α(M)=0.000578 *9*; α(N+..)=0.0001535 *22* α(N)=0.0001313 *19*; α(O)=2.04×10^{-5} *3*; α(P)=1.82×10^{-6} *3* DCO=1.6 *2*. α(K)exp=0.017 *7*. α(K)exp is less than α(K)(E1).
261.4 *1*	12.2 *6*	611.3	13/2$^-$	350.0	9/2$^-$	E2	0.0897	α(K)=0.0676 *10*; α(L)=0.01720 *25*; α(M)=0.00389 *6*; α(N+..)=0.001006 *15* α(N)=0.000873 *13*; α(O)=0.0001267 *18*; α(P)=6.13×10^{-6} *9* DCO=0.8 *2*. α(K)exp=0.051 *9*, α(L)exp=0.015 *7*. α(K)exp is less than for α(K)(E2). α(L)exp gives M1,E2.
286.0 *3*	0.5 *1*	1506.8	19/2$^+$	1220.6	(17/2$^+$)			
286.2 *1*	8.6 *4*	307.8	(9/2)$^+$	21.542	7/2$^+$	(M1+E2)	0.084 *17*	α(K)=0.068 *17*; α(L)=0.0121 *3*;

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^{136}Xe(^{19}F,4nγ) 1995Jo18 (continued)

$\gamma(^{151}Eu)$ (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
								α(M)=0.00266 *12*; α(N+..)=0.000703 *18* α(N)=0.000604 *21*; α(O)=9.19×10^{-5} *17*; α(P)=7.0×10^{-6} *23* DCO=1.7 *2*. α(K)exp=0.043 *3*. This value of α(K)exp does not indicate M1 since it is less than α(K)(E2). Low α(K)exp must be due to contribution from 286.4γ expected to be E1.
286.4 *1*	14.5 *7*	2438.2	(27/2)$^+$	2151.7	25/2$^-$	D[#]		DCO=1.7 *1*.
305.9 *1*	100 *5*	502.1	15/2$^-$	196.2	11/2$^-$	E2	0.0548	α(K)=0.0424 *6*; α(L)=0.00965 *14*; α(M)=0.00217 *3*; α(N+..)=0.000563 *8* α(N)=0.000488 *7*; α(O)=7.17×10^{-5} *10*; α(P)=3.96×10^{-6} *6* DCO=0.92 *7*. α(K)exp=0.043 *1*. α(K)exp gives δ(E2/M1)>4.5.
307.8 *3*	0.5 *1*	307.8	(9/2)$^+$	0.0	5/2$^+$	(Q)[#]		DCO=1.0 *5*.
320.4 *3*	4.2 *4*	2438.2	(27/2)$^+$	2117.8	(27/2)$^-$	E1	0.01299	α(K)=0.01107 *16*; α(L)=0.001512 *22*; α(M)=0.000325 *5*; α(N+..)=8.64×10^{-5} *13* α(N)=7.38×10^{-5} *11*; α(O)=1.150×10^{-5} *17*; α(P)=1.055×10^{-6} *15* DCO=1.0 *2*. α(K)exp=0.011 *2*.
333.9 *3*	0.8 *2*	4460.9	(41/2$^-$)	4126.9	(39/2)$^-$			DCO=3 *1*.
348.2 *3*	1.0 *1*	698.1	(11/2$^-$)	350.0	9/2$^-$			
359.1 *3*	2.8 *3*	1057.1	(15/2$^-$)	698.1	(11/2$^-$)			DCO=1.2 *3*.
379.5 *3*	1.3 *1*	2990.4	(31/2$^+$)	2610.8	(27/2$^+$)			DCO=1.2 *2*.
381.4 *3*	2.9 *3*	3879.3	(37/2$^-$)	3498.0	(35/2)$^-$	M1+E2	0.038 *10*	α(K)=0.031 *9*; α(L)=0.0050 *6*; α(M)=0.00110 *10*; α(N+..)=0.00029 *3* α(N)=0.000249 *24*; α(O)=3.9×10^{-5} *5*; α(P)=3.3×10^{-6} *11* DCO=1.2 *4*. α(K)exp=0.054 *7*. α(K)exp exceeds α(K)(M1) so no E2 is required.
384.0 *1*	15.2 *8*	1947.8	(23/2)$^+$	1563.7	21/2$^-$	E1	0.00834	α(K)=0.00712 *10*; α(L)=0.000964 *14*; α(M)=0.000207 *3*; α(N+..)=5.51×10^{-5} *8* α(N)=4.71×10^{-5} *7*; α(O)=7.36×10^{-6} *11*; α(P)=6.87×10^{-7} *10* DCO=1.6 *1*. α(K)exp=0.0042 *4*. α(K)exp is less than α(K)(E1).
393.0 *3*	2.5 *3*	1506.8	19/2$^+$	1113.9	15/2$^+$	(Q)[#]		DCO=1.1 *4*.
409.7 *3*	4.0 *4*	3046.0	(33/2)$^+$	2636.3	(29/2$^+$)	E2	0.0231	α(K)=0.0185 *3*; α(L)=0.00356 *5*; α(M)=0.000790 *12*; α(N+..)=0.000207 *3* α(N)=0.000179 *3*; α(O)=2.68×10^{-5} *4*; α(P)=1.81×10^{-6} *3* DCO=1.2 *2*. α(K)exp=0.011 *2*. α(K)exp value is less than for α(K)(E2).
415.1 *1*	21.0 *11*	611.3	13/2$^-$	196.2	11/2$^-$	M1+E2	0.030 *8*	α(K)=0.025 *7*; α(L)=0.0039 *5*; α(M)=0.00085 *10*; α(N+..)=0.00023 *3* α(N)=0.000195 *24*; α(O)=3.0×10^{-5} *5*; α(P)=2.6×10^{-6} *9* DCO=1.77 *8*. α(K)exp=0.016 *2*. α(K)exp gives pure E2.
421.7 *3*	0.3 *1*	1462.5	19/2$^+$	1040.9	17/2$^-$			DCO=2.2 *9*.
429.5 *1*	11.2 *6*	1040.9	17/2$^-$	611.3	13/2$^-$	E2	0.0202	α(K)=0.01631 *23*; α(L)=0.00306 *5*; α(M)=0.000678 *10*; α(N+..)=0.0001779 *25* α(N)=0.0001533 *22*; α(O)=2.31×10^{-5} *4*;

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^{136}Xe(^{19}F,4nγ) 1995Jo18 (continued)

γ(^{151}Eu) (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
								α(P)=1.599×10^{-6} *23* DCO=1.04 *7*. α(K)exp=0.015 *2*, α(L)exp=0.003 *1*. α(K)exp gives δ(E2/M1) >2.5.
438.2 *3*	0.8 *2*	2170.6	(25/2$^+$)	1732.7	(21/2$^+$)			
440.9 *3*	2.3 *2*	1947.8	(23/2)$^+$	1506.8	19/2$^+$	Q[#]		DCO=1.0 *1*.
444.4 *3*	3.2 *3*	752.3	13/2$^+$	307.8	(9/2)$^+$	Q[#]		DCO=1.0 *1*.
444.5 *3*	1.9 *2*	1947.8	(23/2)$^+$	1503.2	(23/2)$^-$			DCO=1.4 *2*.
445.7 *3*	0.8 *2*	1057.1	(15/2$^-$)	611.3	13/2$^-$			
447.4 *3*	3.0 *3*	1504.6	(19/2$^-$)	1057.1	(15/2$^-$)			DCO=0.8 *2*.
454.9 *1*	72 *4*	957.0	19/2$^-$	502.1	15/2$^-$	E2	0.01726	α(K)=0.01399 *20*; α(L)=0.00255 *4*; α(M)=0.000564 *8*; α(N+..)=0.0001485 *21* α(N)=0.0001278 *18*; α(O)=1.93×10^{-5} *3*; α(P)=1.381×10^{-6} *20* DCO=1.04 *2*. α(K)exp=0.015 *1*. α(K)exp gives δ(E2/M1)>2.
459.1 *3*	0.2 *1*	2734.8	(27/2$^+$)	2275.6	(25/2$^+$)			E$_\gamma$,I$_\gamma$: from 1992JoZM. Eγ=459 in level scheme figure 6 of 1995Jo18.
462.1 *1*	6.0 *3*	973.2	(15/2)$^+$	511.0	(11/2)$^+$	E2	0.01654	α(K)=0.01342 *19*; α(L)=0.00243 *4*; α(M)=0.000537 *8*; α(N+..)=0.0001414 *20* α(N)=0.0001217 *17*; α(O)=1.84×10^{-5} *3*; α(P)=1.327×10^{-6} *19* DCO=0.8 *1*. α(K)exp=0.013 *2*. α(K)exp gives δ(E2/M1)>2.5.
463.7 *3*	0.4 *1*	1504.6	(19/2$^-$)	1040.9	17/2$^-$			
465.9 *3*	2.1 *2*	2636.3	(29/2$^+$)	2170.6	(25/2$^+$)	(E2)	0.01617	α(K)=0.01314 *19*; α(L)=0.00237 *4*; α(M)=0.000524 *8*; α(N+..)=0.0001379 *20* α(N)=0.0001186 *17*; α(O)=1.80×10^{-5} *3*; α(P)=1.300×10^{-6} *19* DCO=0.8 *2*. α(K)exp(465.9γ+466.0γ)= 0.006 *2*. α(K)exp agrees with E2 and E1 for the two components of the doublet or E1 for both.
466.0 *3*	2.1 *2*	1506.8	19/2$^+$	1040.9	17/2$^-$	(E1)	0.00529	α(K)=0.00452 *7*; α(L)=0.000607 *9*; α(M)=0.0001300 *19*; α(N+..)=3.47×10^{-5} *5* α(N)=2.96×10^{-5} *5*; α(O)=4.65×10^{-6} *7*; α(P)=4.42×10^{-7} *7* DCO=1.8 *4*. α(K)exp(465.9γ+466.0γ)= 0.006 *2*. α(K)exp is consistent with E1 and E2 for the doublet or E1 for both.
468.2 *3*	2.5 *3*	1220.6	(17/2$^+$)	752.3	13/2$^+$	E2	0.01596	α(K)=0.01297 *19*; α(L)=0.00234 *4*; α(M)=0.000516 *8*; α(N+..)=0.0001358 *20* α(N)=0.0001168 *17*; α(O)=1.77×10^{-5} *3*; α(P)=1.284×10^{-6} *18* DCO=1.0 *1*. α(K)exp=0.011 *2*. α(K)exp gives pure E2.
471.8 *3*	0.3 *1*	2224.1	(23/2$^+$)	1752.2	(19/2$^+$)			
472.6 *3*	1.3 *1*	2237.4	(25/2$^+$)	1764.8	(21/2$^+$)			DCO=1.2 *4*.
485.4 *3*	3.0 *3*	1947.8	(23/2)$^+$	1462.5	19/2$^+$	Q[#]		DCO=1.1 *1*.
489.2 *3*	2.5 *3*	3479.6	(35/2$^+$)	2990.4	(31/2$^+$)	(Q)[#]		DCO(489.2γ+489.3γ)=1.0 *2*.
489.3 *3*	5.0 *3*	1462.5	19/2$^+$	973.2	(15/2)$^+$	(Q)[#]		DCO(489.3γ+489.2γ)=1.0 *2*.
489.4 *3*	4.0 *4*	511.0	(11/2)$^+$	21.542	7/2$^+$	(Q)[#]		DCO=1.0 *1*.
490.2 *3*	2.8 *3*	1994.7	(23/2$^-$)	1504.6	(19/2$^-$)			

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^{136}Xe(^{19}F,4nγ) 1995Jo18 (continued)

γ(^{151}Eu) (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
490.3 *1*	7.7 *4*	2438.2	$(27/2)^+$	1947.8	$(23/2)^+$	Q[#]		DCO=0.94 *5*.
498.4 *1*	8.0 *4*	3544.4	$(37/2^+)$	3046.0	$(33/2)^+$	(E2)	0.01350	α(K)=0.01102 *16*; α(L)=0.00193 *3*; α(M)=0.000426 *6*; α(N+..)=0.0001123 *16* α(N)=9.65×10^{-5} *14*; α(O)=1.467×10^{-5} *21*; α(P)=1.098×10^{-6} *16* DCO=1.2 *3*. α(K)exp(498.4γ+498.6γ)=0.012 *2*. α(K)exp gives δ(E2/M1) >1.4 for the doublet.
498.6 *3*	1.0 *1*	1719.2	$(21/2^+)$	1220.6	$(17/2^+)$	(E2)	0.01348	α(K)=0.01101 *16*; α(L)=0.00193 *3*; α(M)=0.000425 *6*; α(N+..)=0.0001121 *16* α(N)=9.64×10^{-5} *14*; α(O)=1.465×10^{-5} *21*; α(P)=1.097×10^{-6} *16* DCO=1.1 *2*. α(K)exp(498.4γ+498.6γ)=0.012 *2*. α(K)exp gives δ(E2/M1) >1.4 for the doublet.
500.7 *3*	1.5 *2*	3879.3	$(37/2^-)$	3378.6	$(33/2^-)$			DCO=1.4 *3*.
501.8 *3*	2.4 *3*	698.1	$(11/2^-)$	196.2	$11/2^-$			DCO=1.2 *4*.
502.6 *3*	0.5 *1*	1113.9	$15/2^+$	611.3	$13/2^-$			
505.0 *3*	0.3 *1*	2224.1	$(23/2^+)$	1719.2	$(21/2^+)$			
510.7 *3*	0.2 *1*	2734.8	$(27/2^+)$	2224.1	$(23/2^+)$			
511.0 *3*	0.5 *1*	2275.6	$(25/2^+)$	1764.8	$(21/2^+)$			DCO=1.6 *2* is inconsistent with ΔJ=2, as required by suggested (1995Jo18) placement.
517.0 *1*	8.0 *4*	2955.2	$(31/2)^+$	2438.2	$(27/2)^+$	E2	0.01225	α(K)=0.01004 *14*; α(L)=0.001733 *25*; α(M)=0.000381 *6*; α(N+..)=0.0001006 *15* α(N)=8.65×10^{-5} *13*; α(O)=1.318×10^{-5} *19*; α(P)=1.003×10^{-6} *14* DCO=0.95 *7*. α(K)exp=0.010 *2*. α(K)exp gives δ(E2/M1)>2.
518.4 *1*	8.4 *4*	2636.3	$(29/2^+)$	2117.8	$(27/2)^-$	E1	0.00416	α(K)=0.00356 *5*; α(L)=0.000474 *7*; α(M)=0.0001016 *15*; α(N+..)=2.72×10^{-5} *4* α(N)=2.32×10^{-5} *4*; α(O)=3.64×10^{-6} *6*; α(P)=3.49×10^{-7} *5* DCO=2.0 *2*. α(K)exp=0.002 *1*. α(K)exp gives pure E1.
522.8 *1*	8.5 *4*	1563.7	$21/2^-$	1040.9	$17/2^-$	E2	0.01190	α(K)=0.00976 *14*; α(L)=0.001677 *24*; α(M)=0.000369 *6*; α(N+..)=9.74×10^{-5} *14* α(N)=8.37×10^{-5} *12*; α(O)=1.276×10^{-5} *18*; α(P)=9.76×10^{-7} *14* DCO=0.92 *5*. α(K)exp=0.010 *2*. α(K)exp gives δ(E2/M1)>1.5.
524.4 *1*	6.0 *3*	3479.6	$(35/2^+)$	2955.2	$(31/2)^+$	(Q)[#]		DCO=1.2 *3*.
525.7 *3*	2.2 *2*	2520.4	$(27/2^-)$	1994.7	$(23/2^-)$			
531.5 *3*	0.7 *2*	1752.2	$(19/2^+)$	1220.6	$(17/2^+)$			DCO=1.8 *6*.
533.2 *3*	5.5 *3*	1995.8	$(23/2^+)$	1462.5	$19/2^+$	Q[#]		DCO=1.03 *6*.
538.5 *3*	1.3 *1*	3529.0	$(35/2^+)$	2990.4	$(31/2^+)$	(Q)[#]		DCO=0.9 *4*.
538.8 *1*	8.0 *4*	1040.9	$17/2^-$	502.1	$15/2^-$	M1+E2	0.015 *5*	α(K)=0.013 *4*; α(L)=0.0019 *4*; α(M)=0.00041 *8*; α(N+..)=0.000110 *21* α(N)=9.4×10^{-5} *18*; α(O)=1.5×10^{-5} *3*; α(P)=1.3×10^{-6} *5* DCO=1.5 *2*. α(K)exp=0.012 *2*. α(K)exp gives δ(E2/M1)=1.3 +*14*−*5*.
546.0 *1*	49.9 *25*	1503.2	$(23/2)^-$	957.0	$19/2^-$	E2	0.01064	α(K)=0.00875 *13*; α(L)=0.001478 *21*; α(M)=0.000325 *5*; α(N+..)=8.58×10^{-5} *12* α(N)=7.37×10^{-5} *11*; α(O)=1.126×10^{-5} *16*; α(P)=8.78×10^{-7} *13* DCO=0.98 *2*. α(K)exp=0.011 *2*. α(K)exp gives

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^{136}Xe(^{19}F,4nγ) 1995Jo18 (continued)

γ(^{151}Eu) (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
								δ(E2/M1)>0.9. Additional information 1.
549.8 *3*	1.2 *1*	1506.8	19/2$^+$	957.0	19/2$^-$			DCO=1.2 *3*.
552.2 *3*	2.4 *3*	2990.4	(31/2$^+$)	2438.2	(27/2)$^+$			DCO=1.0 *3*.
556.0 *3*	1.0 *1*	752.3	13/2$^+$	196.2	11/2$^-$			This placement is considered suspect (by evaluator) since it is not confirmed in other reactions where this level is populated.
556.4 *3*	0.5 *1*	2275.6	(25/2$^+$)	1719.2	(21/2$^+$)			I_γ: Iγ(556γ) relative to 511γ and 772γ is low, as compared to results of 1993Ve04 in (^{6}Li,5nγ), by factors of≈3 and≈6, respectively. 1995Jo18 assigned part of 556γ (Iγ=1.0) from 752 level, in contradiction to other studies. If all of the intensity of 556γ is assigned here, the agreement with (^{6}Li,5nγ) is better. DCO=1.2 *2*.
561.4 *3*	1.5 *2*	2557.2	(27/2$^+$)	1995.8	(23/2$^+$)	Q[#]		DCO=1.0 *2*.
568.7 *3*	2.1 *2*	3089.1	(31/2$^-$)	2520.4	(27/2$^-$)			
573.9 *3*	1.2 *1*	3529.0	(35/2$^+$)	2955.2	(31/2)$^+$			DCO=1.2 *2*.
581.5 *3*	0.3 *1*	2857.1	(29/2$^+$)	2275.6	(25/2$^+$)			
581.6 *3*	1.3 *1*	4460.9	(41/2$^-$)	3879.3	(37/2$^-$)	Q[#]		DCO=1.3 *3*.
588.0 *1*	9.0 *5*	2151.7	25/2$^-$	1563.7	21/2$^-$	E2	0.00882	α(K)=0.00729 *11*; α(L)=0.001198 *17*; α(M)=0.000262 *4*; α(N+..)=6.95×10^{-5} *10* α(N)=5.96×10^{-5} *9*; α(O)=9.15×10^{-6} *13*; α(P)=7.35×10^{-7} *11* DCO=0.89 *7*. α(K)exp=0.011 *2*. α(K)exp gives δ(E2/M1)=0.8 +*8*−*5*.
588.9 *3*	2.6 *3*	3378.6	(33/2$^-$)	2789.7	(31/2)$^-$			
595.9 *3*	1.9 *2*	3378.6	(33/2$^-$)	2782.6	(29/2$^-$)	Q[#]		DCO=1.0 *2*.
603.6 *3*	0.8 *2*	4730.5	(43/2$^-$)	4126.9	(39/2)$^-$			DCO=1.1 *4*.
606.2 *3*	0.4 *1*	3163.4	(31/2$^+$)	2557.2	(27/2$^+$)			DCO=2.0 *9*.
606.7 *3*	3.3 *3*	1563.7	21/2$^-$	957.0	19/2$^-$	M1+E2	0.011 *4*	α(K)=0.009 *3*; α(L)=0.0014 *3*; α(M)=0.00030 *6*; α(N+..)=8.0×10^{-5} *17* α(N)=6.8×10^{-5} *14*; α(O)=1.07×10^{-5} *24*; α(P)=1.0×10^{-6} *4* DCO=1.2 *2*. α(K)exp=0.012 *3*. α(K)exp gives δ(E2/M1)<1.2.
611.7 *3*	2.5 *3*	4140.7	(39/2$^+$)	3529.0	(35/2$^+$)			
612		1113.9	15/2$^+$	502.1	15/2$^-$			γ shown only in the level scheme figure.
614.7 *1*	25.9 *13*	2117.8	(27/2)$^-$	1503.2	(23/2)$^-$	E2	0.00790	α(K)=0.00654 *10*; α(L)=0.001059 *15*; α(M)=0.000232 *4*; α(N+..)=6.14×10^{-5} *9* α(N)=5.27×10^{-5} *8*; α(O)=8.10×10^{-6} *12*; α(P)=6.62×10^{-7} *10* DCO=0.97 *2*. α(K)exp=0.008 *1*. α(K)exp gives δ(E2/M1)>1.1.
614.9 *3*	1.5 *2*	2610.8	(27/2$^+$)	1995.8	(23/2$^+$)	Q[#]		DCO=1.0 *1*. Authors′ DCO=1.00 *1* is probably a misprint.
628.8 *3*	2.0 *2*	4126.9	(39/2)$^-$	3498.0	(35/2)$^-$	E2	0.00747	α(K)=0.00620 *9*; α(L)=0.000996 *14*; α(M)=0.000218 *3*; α(N+..)=5.77×10^{-5} *9* α(N)=4.95×10^{-5} *7*; α(O)=7.62×10^{-6} *11*; α(P)=6.28×10^{-7} *9* DCO=1.1 *2*. α(K)exp=0.013 *3*. α(K)exp gives δ(E2/M1)<0.7.
630.8 *3*	2.2 *2*	2782.6	(29/2$^-$)	2151.7	25/2$^-$	Q[#]		DCO=1.3 *2*.

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^{136}Xe(^{19}F,4nγ) 1995Jo18 (continued)

γ(^{151}Eu) (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
[x]639.8 *3*	2.2 *2*							Placement suggested as 37/2$^+$ to 33/2$^+$ transition from a 4287 level, but no evidence exists for a 3647 level.
640.1 *3*	2.2 *2*	4119.7	(39/2$^+$)	3479.6	(35/2$^+$)			DCO=1.1 *3*.
641.2 *3*	2.6 *3*	4185.6	(41/2$^+$)	3544.4	(37/2$^+$)			
643.7 *3*	0.2 *1*	3807.1	(35/2$^+$)	3163.4	(31/2$^+$)			
647.9 *3*	0.3 *1*	2923.5		2275.6	(25/2$^+$)			Placement from 1993Ve04. 1995Jo18 suggest, in table 2, placement from a 2885, 29/2$^+$ level to 2237, 25/2$^+$ level.
648.6 *3*	1.2 *1*	2151.7	25/2$^-$	1503.2	(23/2)$^-$	M1+E2	0.010 *3*	α(K)=0.0081 *23*; α(L)=0.00116 *25*; α(M)=0.00025 *6*; α(N+..)=6.7×10^{-5} *15* α(N)=5.7×10^{-5} *12*; α(O)=9.0×10^{-6} *21*; α(P)=9.E−7 *3* DCO=0.9 *2*. α(K)exp=0.011 *2*. α(K)exp gives δ(E2/M1)<0.7.
664.8 *3*	1.2 *1*	2782.6	(29/2$^-$)	2117.8	(27/2)$^-$			DCO=1.0 *3*.
667.2 *3*	1.3 *1*	4807.9	(43/2$^+$)	4140.7	(39/2$^+$)			
667.3 *3*	1.1 *1*	2170.6	(25/2$^+$)	1503.2	(23/2)$^-$			
671.9 *1*	15.9 *8*	2789.7	(31/2)$^-$	2117.8	(27/2)$^-$	E2	0.00636	α(K)=0.00530 *8*; α(L)=0.000834 *12*; α(M)=0.000182 *3*; α(N+..)=4.83×10^{-5} *7* α(N)=4.14×10^{-5} *6*; α(O)=6.39×10^{-6} *9*; α(P)=5.39×10^{-7} *8* DCO=1.1 *1*. α(K)exp=0.007 *1*. α(K)exp gives δ(E2/M1)=1.3 *+11−5*.
708.4 *3*	3.9 *4*	3498.0	(35/2)$^-$	2789.7	(31/2)$^-$	E2	0.00562	α(K)=0.00469 *7*; α(L)=0.000726 *11*; α(M)=0.0001582 *23*; α(N+..)=4.21×10^{-5} *6* α(N)=3.60×10^{-5} *5*; α(O)=5.58×10^{-6} *8*; α(P)=4.78×10^{-7} *7* DCO=1.0 *2*. α(K)exp=0.005 *2*. α(K)exp gives δ(E2/M1)>0.7.
718.5 *3*	0.5 *1*	1220.6	(17/2$^+$)	502.1	15/2$^-$	D[#]		DCO=0.8 *2*.
738.9 *3*	0.8 *2*	4858.6	(43/2$^+$)	4119.7	(39/2$^+$)			
762.1 *3*	2.0 *2*	1719.2	(21/2$^+$)	957.0	19/2$^-$			DCO=1.0 *3*. Mult.: E2 in 1995Jo18 is inconsistent with 21/2$^+$ to 19/2$^-$ transition.
772.4 *3*	0.8 *2*	2275.6	(25/2$^+$)	1503.2	(23/2)$^-$			
776.0 *3*	0.6 *2*	1732.7	(21/2$^+$)	957.0	19/2$^-$			DCO=1.1 *4*.
782.8 *3*	1.0 *1*	4968.4	(45/2$^+$)	4185.6	(41/2$^+$)			
803.8 *3*	0.4 *1*	5662.4	(47/2$^+$)	4858.6	(43/2$^+$)			DCO=1.6 *7*.
807.9 *3*	1.6 *2*	1764.8	(21/2$^+$)	957.0	19/2$^-$			DCO=1.4 *3*.
808.5 *3*	0.2 *1*	5776.9	(49/2$^+$)	4968.4	(45/2$^+$)			
860.9 *3*	1.5 *2*	1057.1	(15/2$^-$)	196.2	11/2$^-$			
974.6 *3*	0.6 *2*	3092.4		2117.8	(27/2)$^-$			DCO=1.4 *4*.
1002.6 *3*	0.8 *2*	1504.6	(19/2$^-$)	502.1	15/2$^-$	(Q)[#]		Mult.: DCO=0.8 *4*.
1017.3 *3*	0.7 *2*	2520.4	(27/2$^-$)	1503.2	(23/2)$^-$			
1037.6 *3*	0.8 *2*	1994.7	(23/2$^-$)	957.0	19/2$^-$			DCO=1.8 *9*.

[†] 1995Jo18 quote a general uncertainty of 0.1 keV. However, for weak γ rays (Iγ<5 or so), Δ(Eγ)=0.1 keV seems to be an underestimate. For these γ rays, Δ(Eγ)=0.3 keV is assigned by the evaluator.

[‡] From ce data and DCO ratios (most likely gated on ΔJ=2, quadrupole transitions). The ce data were normalized to known strong E2 transitions in ^{150}Eu populated in the same reaction.

[#] Assigned as D (implying ΔJ=1) or Q (implying ΔJ=2, most likely E2) by the evaluator. 1995Jo18 assigned M1 or E1 for ΔJ=1

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^{136}Xe(^{19}F,4nγ) 1995Jo18 (continued)

$\gamma(^{151}Eu)$ (continued)

and E2 for ΔJ=2 transitions.

[@] 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.

[x] γ ray not placed in level scheme.

^{136}Xe(^{19}F,4nγ) 1995Jo18

Level Scheme

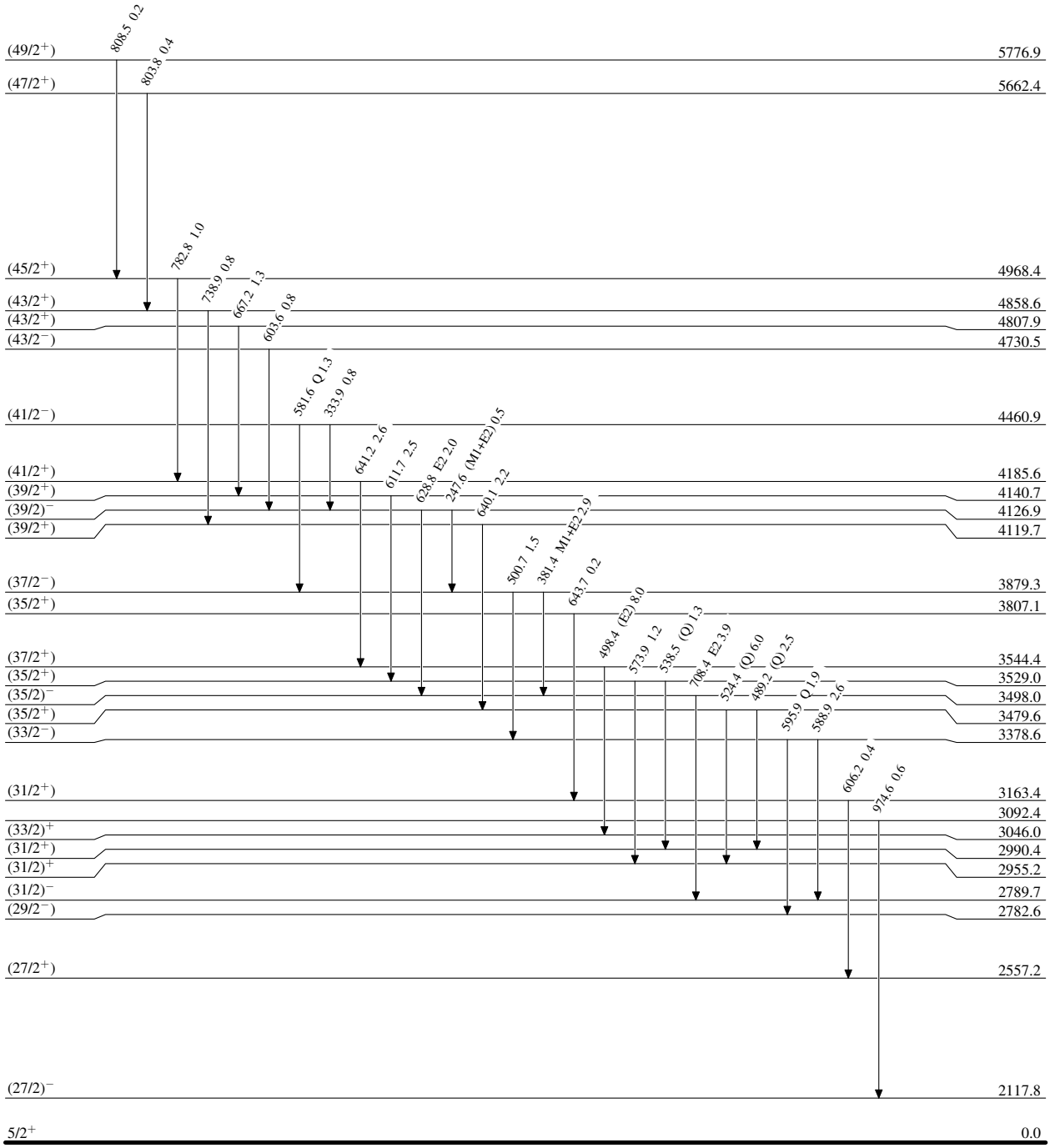
Intensities: Relative I_γ

Legend

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

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

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



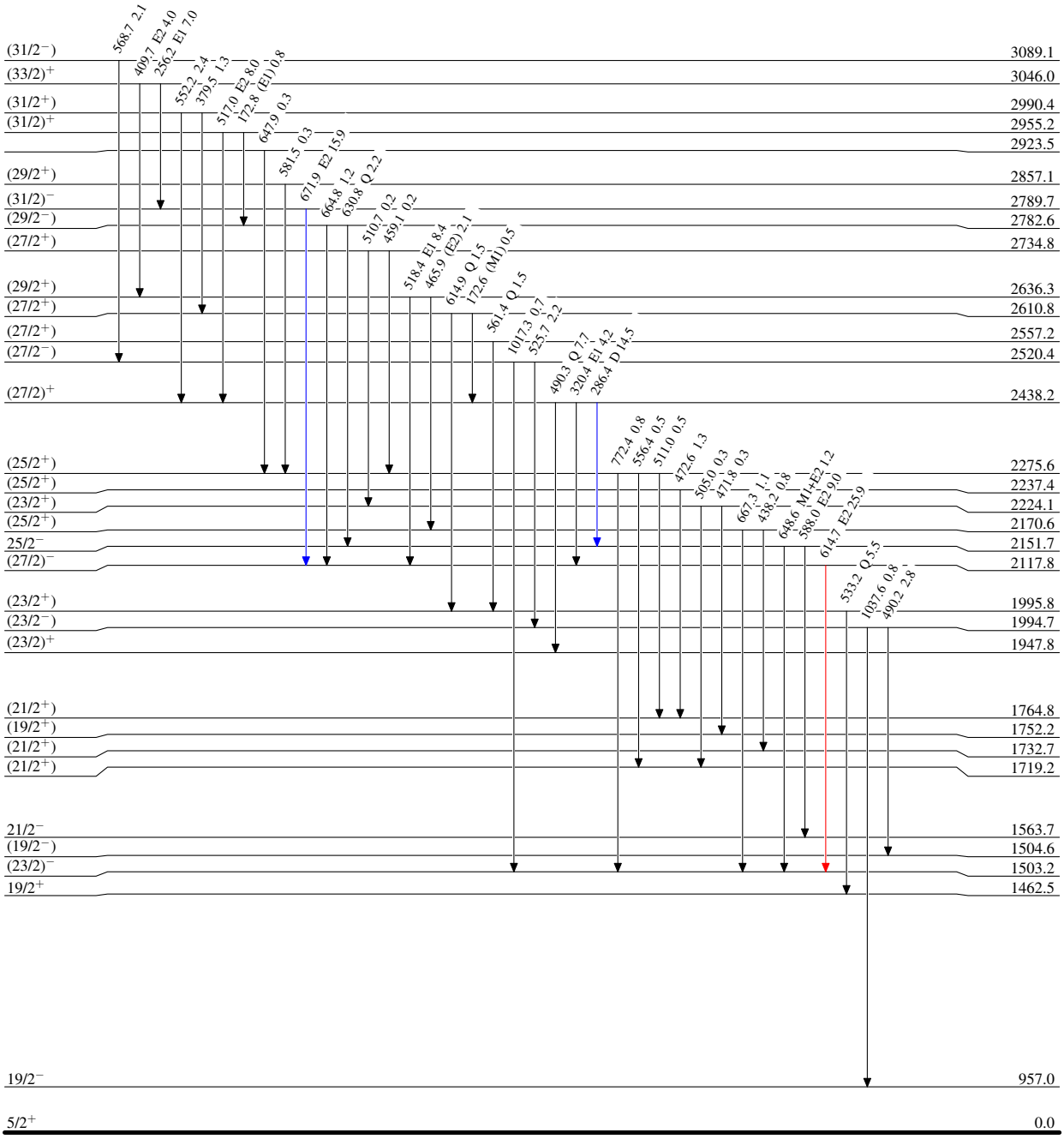
$^{151}_{63}Eu_{88}$

^{136}Xe(^{19}F,4nγ) 1995Jo18

Level Scheme (continued)

Intensities: Relative I_γ

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

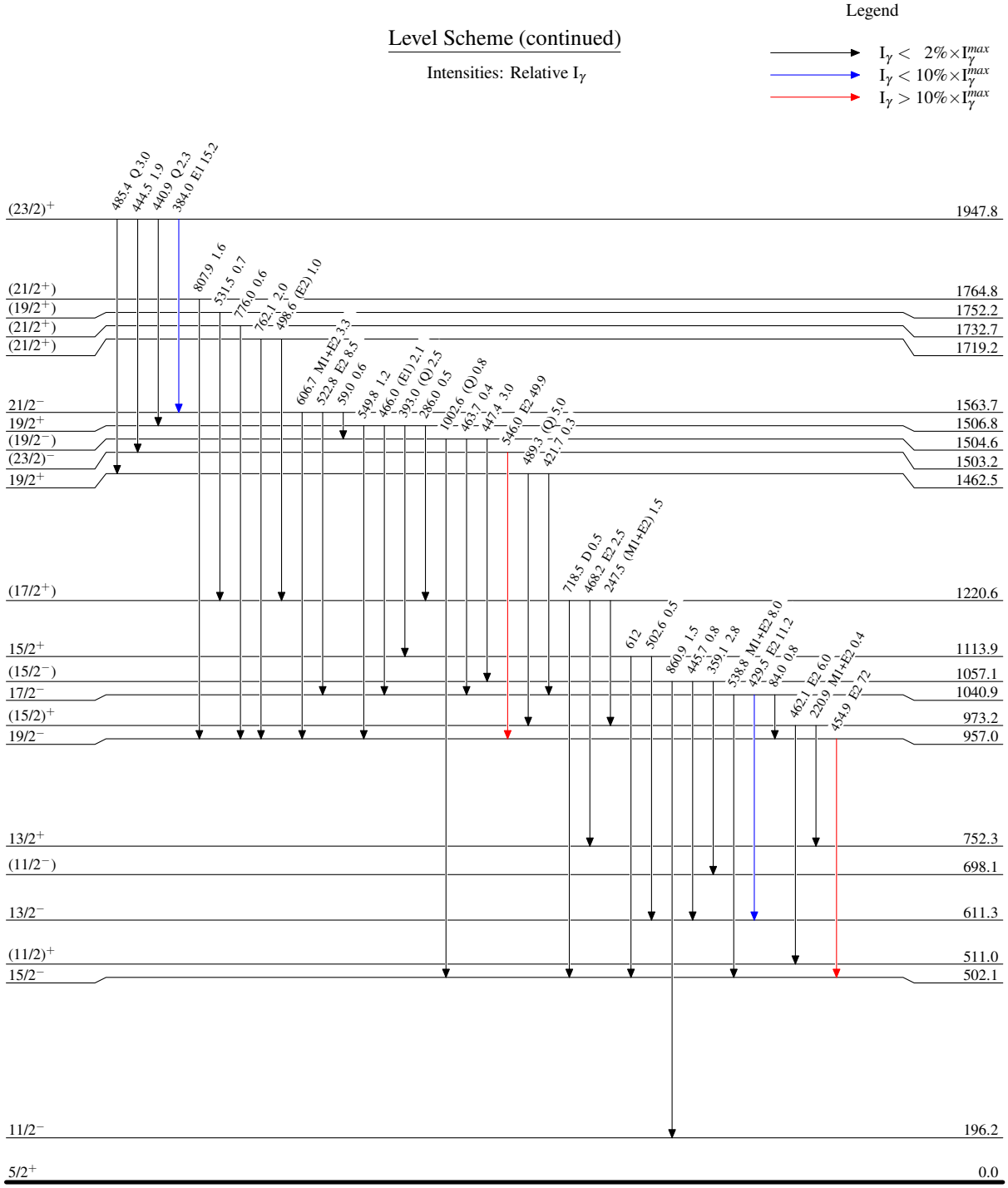


$^{151}_{63}Eu_{88}$

$^{136}Xe(^{19}F,4n\gamma)$ **1995Jo18**

Level Scheme (continued)

Intensities: Relative I_γ

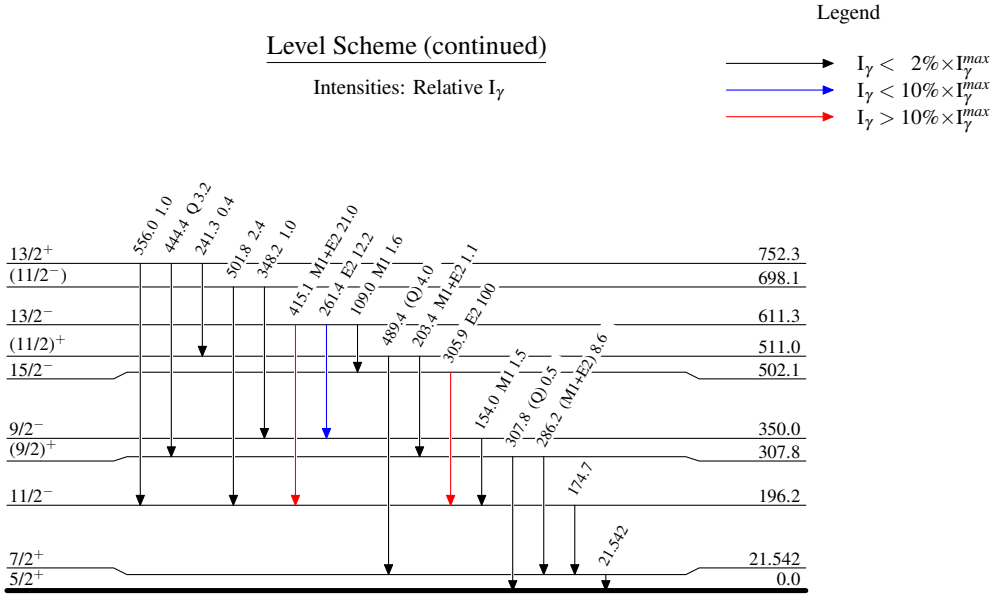


$^{151}_{63}Eu_{88}$

^{136}Xe(^{19}F,4nγ) 1995Jo18

Level Scheme (continued)

Intensities: Relative I_γ



$^{151}_{63}Eu_{88}$