^{154}Sm(^{19}F,4nγ) 1993Og01

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 109, 2033 (2008)	15-Jun-2008

E(^{19}F)=85 MeV; 98.67% ^{154}Sm targets, stacked foils or Pb-backed foils; NORDBALL detector array (15 Ge-BGO spectrometers and 10 BaF_2 multiplicity-filter detectors); measured Eγ, Iγ, $\gamma\gamma$ coin, DCO ratios (θ=37° (or 143°) and 79° (or 101°)), $T_{1/2}$ from DSAM; particle rotor calculations. See 1993Ko09 for further discussion of these data.

The level scheme is taken from 1993Og01. The authors report two additional coupled bands which apparently belong to either ^{169}Lu or ^{168}Lu. The energies of all but two of the 52 transitions in those bands match those in bands subsequently assigned to ^{168}Lu by 1998Ha17, 1999Ka17 and/or 2002Ha33, so the evaluator concludes that those additional bands reported by 1993Og01 actually belong to ^{168}Lu.

^{169}Lu Levels

E(level)†	Jπ#	E(level)†	Jπ#	E(level)†	Jπ#	E(level)†	Jπ#
0.0[b]	7/2+	843.3[f] 9	15/2+	2080.1[b] 14	27/2+	4156.6[a] 20	(41/2+)
43.1‡[c] 6	5/2−	844.4[&] 8	15/2−	2198.1[f] 13	27/2+	4239.9[@] 18	41/2−
114.7[f] 11	3/2+	896.1?[d] 12	(15/2−)	2214.1[&] 13	27/2−	4294.3[g] 21	(41/2+)
123.2[a] 7	9/2+	938.4[h] 10	15/2+	2356.5[a] 14	29/2+	4494.9[b] 20	(43/2+)
141.2[c] 8	9/2−	978.7[c] 12	21/2−	2495.0[@] 14	29/2−	4504.2[c] 20	45/2−
187.1[g] 11	5/2+	1031.4[@] 8	17/2−	2507.8[c] 16	33/2−	4542.0[&] 18	43/2−
226.2[e] 12	5/2+	1059.9[b] 10	19/2+	2543.4[g] 13	29/2+	4645.3[f] 19	43/2+
261.4[f] 8	7/2+	1117.7[g] 9	17/2+	2643.5[b] 15	31/2+	4835.9[a] 22	(45/2+)
270.4[b] 7	11/2+	1152.4[e] 14	17/2+	2741.3[f] 14	31/2+	4878.8[@] 19	45/2−
289.6[h] 11	7/2+	1233.8[&] 9	19/2−	2771.4[&] 14	31/2−	4964.3[g] 23	(45/2+)
330.5[c] 9	13/2−	1245.7[f] 10	19/2+	2930.4[a] 16	33/2+	5202.9[b] 23	(47/2+)
415.3[g] 9	9/2+	1288.5?[d] 12	(19/2−)	3064.8[@] 15	33/2−	5203.7[&] 19	47/2−
439.1[a] 8	13/2+	1297.8[a] 11	21/2+	3092.5[g] 15	33/2+	5271.1[c] 23	(49/2−)
439.2[@] 7	9/2−	1424.7[c] 13	25/2−	3126.1[c] 18	37/2−	5371.9[f] 20	47/2+
450.3[e] 9	9/2+	1461.3[@] 10	21/2−	3230.6[b] 16	35/2+	5577.9[a] 24	(49/2+)
509.4[f] 8	11/2+	1548.6[b] 12	23/2+	3330.3[f] 16	35/2+	5690.3?[g] 25	(49/2+)
546.2[&] 7	11/2−	1551.9[g] 10	21/2+	3351.6[&] 16	35/2−	5974.9[b] 25	(51/2+)
569.2[h] 10	11/2+	1696.4[&] 11	23/2−	3527.6[a] 17	37/2+	6092.8[c] 25	(53/2−)
610.9[c] 10	17/2−	1699.5[f] 11	23/2+	3647.2[@] 16	37/2−	6129.0?[f] 23	(51/2+)
628.6[b] 8	15/2+	1747.0?[d] 16	(23/2−)	3674.2[g] 18	(37/2+)	6382[a] 3	(53/2+)
683.2[@] 7	13/2−	1809.2[a] 13	25/2+	3790.7[c] 19	41/2−	6904.7?[f] 25	(55/2+)
734.4[g] 9	13/2+	1938.1[c] 15	29/2−	3842.9[b] 18	39/2+	6965[c] 3	(57/2−)
764.4[e] 9	13/2+	1955.2[@] 12	25/2−	3936.4[&] 17	39/2−		
835.7[a] 9	17/2+	2028.7[g] 12	25/2+	3965.2[f] 18	39/2+		

† From least-squares fit to Eγ, assigning 1 keV uncertainty to all Eγ data and assuming E=43.1 *6* (from Adopted Levels) for the 5/2− 1/2[541] state.

‡ From Adopted Levels; held fixed in least-squares level-energy adjustment.

Authors′ values, based on deduced band structure, analogy to neighboring nuclides, and alignment gains, band crossing frequencies and B(M1)/B(E2) ratios for intraband transitions, when available. all values are consistent with adopted values, but use of parentheses differs.

@ Band(A): 9/2[514] α=+1/2 band. First band crossing At $\hbar\omega\approx$0.27 MeV, alignment gain≥6.2$\hbar$.

& Band(a): 9/2[514] α=−1/2 band. See comment on signature partner band.

a Band(B): 7/2[404] α=+1/2 band. First band crossing At $\hbar\omega\approx$0.28 MeV, alignment gain≈6.2$\hbar$. Band assignment supported by observed B(M1)/B(E2) ratios for intraband transitions.

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^{154}Sm(^{19}F,4nγ) 1993Og01 (continued)

^{169}Lu Levels (continued)

[b] Band(b): 7/2[404] α=−1/2 band. See comment on signature partner band.
[c] Band(C): 1/2[541] α=+1/2 band. First band crossing At $\hbar\omega\approx$0.32 MeV, alignment gain≈3.5$\hbar$. Average Q(transition)=7.5 b *10* for J=33/2 through 57/2 band members.
[d] Band(c): 1/2[541] α=−1/2 band.
[e] Band(D): 1/2[411] α=+1/2 band. Strongly mixed with 5/2[402] α=+1/2 band.
[f] Band(d): 1/2[411] α=−1/2 band. First band crossing At $\hbar\omega\approx$0.28 MeV, alignment gain≥7.9$\hbar$.
[g] Band(E): 5/2[402] α=+1/2 band. Strongly mixed with 1/2[411] α=+1/2 band. First band crossing At $\hbar\omega\approx$0.26 MeV, alignment gain≈6.1$\hbar$.
[h] Band(e): 5/2[402] α=−1/2 band.

γ(^{169}Lu)

1993Og01 provide their data In a series of tables and figures. most data are taken from the summary of measured properties given In table 1a for In-band transitions and, for interband transitions, In table 1b (1/2[411] to 1/2[541] transitions and gated intensities for 1/2[411] ΔJ=2 In-band transitions), table 1c (9/2[514] to 7/2[404]), table 1d (5/2[402] to 1/2[411]) and table 1e (between 5/2[402] and 1/2[411]). however, some information was also taken from the gated spectra In fig. 2a-d, the proposed level scheme In fig. 3 (parts I and II), As indicated.

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
97.7	22.3 *6*	141.2	9/2$^-$	43.1	5/2$^-$	
102.2	6.2 *5*	289.6	7/2$^+$	187.1	5/2$^+$	
107.0		546.2	11/2$^-$	439.2	9/2$^-$	E_γ: from fig. 2b (coincidence spectra gated by 593γ or 137γ) and fig. 3 (part I); absent in table 1a.
111.5	1.1 *2*	226.2	5/2$^+$	114.7	3/2$^+$	
123.5	31.8 *10*	123.2	9/2$^+$	0.0	7/2$^+$	
126.1	4.5 *6*	415.3	9/2$^+$	289.6	7/2$^+$	
137.1	17.6 *8*	683.2	13/2$^-$	546.2	11/2$^-$	DCO=1.17 *10*.
146.8	12.4 *9*	261.4	7/2$^+$	114.7	3/2$^+$	
147.2	25.5 *15*	270.4	11/2$^+$	123.2	9/2$^+$	DCO=1.00 *5*.
153.8	0.6 *2*	415.3	9/2$^+$	261.4	7/2$^+$	
153.9	11.0 *25*	569.2	11/2$^+$	415.3	9/2$^+$	
161.4	28.7 *7*	844.4	15/2$^-$	683.2	13/2$^-$	
164.7	18.8 *13*	734.4	13/2$^+$	569.2	11/2$^+$	
169.0	21.1 *10*	439.1	13/2$^+$	270.4	11/2$^+$	
175.0[@]		1233.8	19/2$^-$	1059.9	19/2$^+$	
179.0	3.2 *3*	1117.7	17/2$^+$	938.4	15/2$^+$	
186.8	17.4 *6*	1031.4	17/2$^-$	844.4	15/2$^-$	DCO=1.10 *7*.
188.7	1.9 *3*	450.3	9/2$^+$	261.4	7/2$^+$	
189.0	100.0	330.5	13/2$^-$	141.2	9/2$^-$	DCO=1.08 *10*.
189.4	16.1 *10*	628.6	15/2$^+$	439.1	13/2$^+$	DCO=0.91 *5*.
197.0		1031.4	17/2$^-$	835.7	17/2$^+$	
203.2	20.1 *4*	1233.8	19/2$^-$	1031.4	17/2$^-$	
203.8	6.3 *4*	938.4	15/2$^+$	734.4	13/2$^+$	
207.2	14.5 *10*	835.7	17/2$^+$	628.6	15/2$^+$	
215.7		844.4	15/2$^-$	628.6	15/2$^+$	
218.0	≤0.78	261.4	7/2$^+$	43.1	5/2$^-$	
224.0	2.1 *3*	450.3	9/2$^+$	226.2	5/2$^+$	
224.1	11.5 *6*	1059.9	19/2$^+$	835.7	17/2$^+$	DCO=1.01 *8*.
224.8	5.0 *6*	734.4	13/2$^+$	509.4	11/2$^+$	
227.1	14.2 *10*	1461.3	21/2$^-$	1233.8	19/2$^-$	DCO=1.18 *10*.
228.3	≤1.1	415.3	9/2$^+$	187.1	5/2$^+$	
235.2	15.4 *8*	1696.4	23/2$^-$	1461.3	21/2$^-$	

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^{154}Sm(^{19}F,4nγ) 1993Og01 (continued)

γ(^{169}Lu) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
237.9	9.3 *5*	1297.8	21/2$^+$	1059.9	19/2$^+$		
244.1		683.2	13/2$^-$	439.2	9/2$^-$		Eγ is for doublet. Iγ for this component is not stated in 1993Og01; authors assume it will be such that B(M1)/B(E2) for the intraband ΔJ=1 and ΔJ=2 transitions from the 683 level will be consistent with expected value of≈1.5.
244.1	13.9 *20*	683.2	13/2$^-$	439.1	13/2$^+$		
247.9	11.1 *5*	509.4	11/2$^+$	261.4	7/2$^+$		
251.0	6.9 *2*	1548.6	23/2$^+$	1297.8	21/2$^+$		
255.0	1.7 *2*	764.4	13/2$^+$	509.4	11/2$^+$		
258.7	11.8 *10*	1955.2	25/2$^-$	1696.4	23/2$^-$		DCO=1.01 *7*.
258.9	12.8 *13*	2214.1	27/2$^-$	1955.2	25/2$^-$		
260.7	7.0 *6*	1809.2	25/2$^+$	1548.6	23/2$^+$		
263.5	0.6 *2*	450.3	9/2$^+$	187.1	5/2$^+$		
270.7	30.0 *14*	270.4	11/2$^+$	0.0	7/2$^+$		
270.7	4.9 *4*	2080.1	27/2$^+$	1809.2	25/2$^+$		
274.3	3.5 *3*	1117.7	17/2$^+$	843.3	15/2$^+$		
276.0		546.2	11/2$^-$	270.4	11/2$^+$		
276.4	5.5 *4*	2356.5	29/2$^+$	2080.1	27/2$^+$		
276.5	15.1 *10*	2771.4	31/2$^-$	2495.0	29/2$^-$	D+Q	Mult.: DCO=1.55 *10*.
279.0	4.0 *10*	569.2	11/2$^+$	289.6	7/2$^+$		
280.6	102.0 *15*	610.9	17/2$^-$	330.5	13/2$^-$		DCO=1.14 *15*.
281.0	11.6 *16*	2495.0	29/2$^-$	2214.1	27/2$^-$	D+Q	Mult.: DCO=1.20 *6*.
284.3	2.2 *6*	734.4	13/2$^+$	450.3	9/2$^+$		
286.5	5.3 *12*	2930.4	33/2$^+$	2643.5	31/2$^+$		
286.8	12.6 *5*	3351.6	35/2$^-$	3064.8	33/2$^-$	D+Q	Mult.: DCO=1.47 *9*.
286.9	7.5 *5*	2643.5	31/2$^+$	2356.5	29/2$^+$		
289.3	7.3 *7*	3936.4	39/2$^-$	3647.2	37/2$^-$		
293.5	15.2 *20*	3064.8	33/2$^-$	2771.4	31/2$^-$		DCO=1.9 *3* for contaminated G.
295.5	12.6 *12*	3647.2	37/2$^-$	3351.6	35/2$^-$		
297.0	2.3 *6*	3527.6	37/2$^+$	3230.6	35/2$^+$		
298.5	9.5 *6*	844.4	15/2$^-$	546.2	11/2$^-$		
300.0	4.8 *10*	3230.6	35/2$^+$	2930.4	33/2$^+$		
302.0	7.9 *16*	4542.0	43/2$^-$	4239.9	41/2$^-$		
303.5	8.0 *8*	4239.9	41/2$^-$	3936.4	39/2$^-$		DCO=1.98 *25* for contaminated G.
306.7	3.4 *3*	1551.9	21/2$^+$	1245.7	19/2$^+$		
314.0	3.5 *3*	764.4	13/2$^+$	450.3	9/2$^+$		
315.3		3842.9	39/2$^+$	3527.6	37/2$^+$		From fig. 3 (part I); absent in table 1a.
316.0	37.1 *12*	439.1	13/2$^+$	123.2	9/2$^+$		
316.0	68 *3*	439.2	9/2$^-$	123.2	9/2$^+$		
319.2	10.3 *5*	734.4	13/2$^+$	415.3	9/2$^+$		DCO=1.32 *18*.
325.0	5 *3*	5203.7	47/2$^-$	4878.8	45/2$^-$		
329.4	1.60 *15*	2028.7	25/2$^+$	1699.5	23/2$^+$		
333.8	13.9 *3*	843.3	15/2$^+$	509.4	11/2$^+$	Q	Iγ: from gated spectra (table 1b of 1993Og01); 13.9 *5* in table 1a. Mult.: DCO=0.97 *5*.
337.0	4.0 *20*	4878.8	45/2$^-$	4542.0	43/2$^-$		
345.3	1.1 *2*	2543.4	29/2$^+$	2198.1	27/2$^+$		
348.2	7.6 *8*	1031.4	17/2$^-$	683.2	13/2$^-$		
349.2	1.1 *2*	764.4	13/2$^+$	415.3	9/2$^+$		
351.2	1.5 *4*	3092.5	33/2$^+$	2741.3	31/2$^+$		
353.3	3.4 *3*	1117.7	17/2$^+$	764.4	13/2$^+$		
358.4	38.6 *18*	628.6	15/2$^+$	270.4	11/2$^+$		
367.6	101.0 *10*	978.7	21/2$^-$	610.9	17/2$^-$	(Q)	Mult.: DCO=0.99 *10*.
368.0	≤0.23	509.4	11/2$^+$	141.2	9/2$^-$		
369.0	6.0 *3*	938.4	15/2$^+$	569.2	11/2$^+$		
383.3	9.5 *6*	1117.7	17/2$^+$	734.4	13/2$^+$		DCO=1.12 *19*.

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^{154}Sm(^{19}F,4nγ) 1993Og01 (continued)

γ(^{169}Lu) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
388.0	3.3 *3*	1152.4	17/2$^+$	764.4	13/2$^+$		
390.2	12.5 *8*	1233.8	19/2$^-$	843.3	15/2$^+$		
392.3 [@]		1288.5?	(19/2$^-$)	896.1?	(15/2$^-$)		E_γ: From fig. 3 (Part II); absent in table 1a.
396.8	42.0 *9*	835.7	17/2$^+$	439.1	13/2$^+$		
397.0	1.3 *3*	1233.8	19/2$^-$	835.7	17/2$^+$		
401.7	9.9 *3*	1245.7	19/2$^+$	844.4	15/2$^-$	Q	I_γ: from gated spectra (table 1b of 1993Og01); 9.9 *5* in table 1a. Mult.: DCO=0.87 *6*.
403.0	3.2 *4*	1031.4	17/2$^-$	628.6	15/2$^+$		
405.4	7.0 *9*	844.4	15/2$^-$	439.1	13/2$^+$		
412.7	6.4 *6*	683.2	13/2$^-$	270.4	11/2$^+$		
423.0	7.0 *4*	546.2	11/2$^-$	123.2	9/2$^+$		
430.5	10.6 *3*	1461.3	21/2$^-$	1031.4	17/2$^-$		
431.3	43.2 *10*	1059.9	19/2$^+$	628.6	15/2$^+$		
433.6	11.8 *10*	1551.9	21/2$^+$	1117.7	17/2$^+$		
439.4	29.1 *10*	439.2	9/2$^-$	0.0	7/2$^+$		
445.7	88.0 *13*	1424.7	25/2$^-$	978.7	21/2$^-$		DCO=1.09 *15*.
454.0	8.1 *4*	1699.5	23/2$^+$	1245.7	19/2$^+$	Q	Mult.: DCO=0.88 *5*.
458.5 [@]		1747.0?	(23/2$^-$)	1288.5?	(19/2$^-$)		E_γ: From fig. 3 (Part II); absent in table 1a.
462.0	42.8 *20*	1297.8	21/2$^+$	835.7	17/2$^+$		
462.3	12.8 *10*	1696.4	23/2$^-$	1233.8	19/2$^-$		
476.8	9.0 *5*	2028.7	25/2$^+$	1551.9	21/2$^+$		
488.8	35.3 *10*	1548.6	23/2$^+$	1059.9	19/2$^+$		
494.1	12.0 *6*	1955.2	25/2$^-$	1461.3	21/2$^-$		
498.8	4.9 *3*	2198.1	27/2$^+$	1699.5	23/2$^+$		I_γ: from gated spectra (table 1b of 1993Og01); 7.9 *3* in table 1a appears to be a typographical error. DCO=1.09 *5*.
511.3	34.2 *15*	1809.2	25/2$^+$	1297.8	21/2$^+$		
512.5	1.16 *25*	843.3	15/2$^+$	330.5	13/2$^-$		
513.4	99 *3*	1938.1	29/2$^-$	1424.7	25/2$^-$		
514.8	9.0 *10*	2543.4	29/2$^+$	2028.7	25/2$^+$		
517.7	15.0 *15*	2214.1	27/2$^-$	1696.4	23/2$^-$		
531.5	29.4 *7*	2080.1	27/2$^+$	1548.6	23/2$^+$		
539.8	14.6 *14*	2495.0	29/2$^-$	1955.2	25/2$^-$		
543.2	4.3 *3*	2741.3	31/2$^+$	2198.1	27/2$^+$		I_γ: from gated spectra (table 1b of 1993Og01); 4.3 *12* in table 1a. DCO=0.88 *20*.
547.4	33.2 *15*	2356.5	29/2$^+$	1809.2	25/2$^+$		
549.1	8.7 *15*	3092.5	33/2$^+$	2543.4	29/2$^+$		
557.2	19.0 *6*	2771.4	31/2$^-$	2214.1	27/2$^-$		
563.2	33.0 *20*	2643.5	31/2$^+$	2080.1	27/2$^+$		
565.6 [@]		896.1?	(15/2$^-$)	330.5	13/2$^-$		E_γ: From fig. 3 (Part II); absent in table 1. Note that labels for 565.6γ and 677.6γ were mistakenly interchanged on level scheme.
569.8	45.9 *7*	2507.8	33/2$^-$	1938.1	29/2$^-$		DCO=1.10 *10*.
569.8	14.8 *14*	3064.8	33/2$^-$	2495.0	29/2$^-$		
574.1	36.9 *6*	2930.4	33/2$^+$	2356.5	29/2$^+$		
580.2	14.1 *7*	3351.6	35/2$^-$	2771.4	31/2$^-$		
581.7	8.5 *15*	3674.2	(37/2$^+$)	3092.5	33/2$^+$		
582.3	14.4 *10*	3647.2	37/2$^-$	3064.8	33/2$^-$		
584.8	9.1 *10*	3936.4	39/2$^-$	3351.6	35/2$^-$		
587.3	32.1 *20*	3230.6	35/2$^+$	2643.5	31/2$^+$		
589.0	2.6 *2*	3330.3	35/2$^+$	2741.3	31/2$^+$		I_γ: from gated spectra (table 1b of 1993Og01); 2.6 *3* in table 1a. DCO=1.25 *12*.

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^{154}Sm(^{19}F,4nγ) 1993Og01 (continued)

$\gamma(^{169}Lu)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
592.7	7.4 *12*	4239.9	$41/2^-$	3647.2	$37/2^-$	
597.2	15.9 *10*	3527.6	$37/2^+$	2930.4	$33/2^+$	
605.7	11.1 *15*	4542.0	$43/2^-$	3936.4	$39/2^-$	
612.3	6.0 *4*	3842.9	$39/2^+$	3230.6	$35/2^+$	
618.4	40.1 *6*	3126.1	$37/2^-$	2507.8	$33/2^-$	DCO=0.9 *3*.
620.1	8.0 *10*	4294.3	$(41/2^+)$	3674.2	$(37/2^+)$	
629.0	3.1 *5*	4156.6	$(41/2^+)$	3527.6	$37/2^+$	
634.7	1.7 *3*	3965.2	$39/2^+$	3330.3	$35/2^+$	I_γ: from gated spectra (table 1b of 1993Og01); 1.7 *5* in table 1a. DCO=1.07 *20*.
635.0	2.0 *4*	1245.7	$19/2^+$	610.9	$17/2^-$	
638.8	4.1 *15*	4878.8	$45/2^-$	4239.9	$41/2^-$	
652.0	5.8 *7*	4494.9	$(43/2^+)$	3842.9	$39/2^+$	
661.6	6.7 *23*	5203.7	$47/2^-$	4542.0	$43/2^-$	
664.7	16.9 *12*	3790.7	$41/2^-$	3126.1	$37/2^-$	DCO=0.9 *3*.
670.0	2.0 *3*	4964.3	$(45/2^+)$	4294.3	$(41/2^+)$	
677.6[@]		1288.5?	$(19/2^-)$	610.9	$17/2^-$	E_γ: From fig. 3 (Part II); absent in table 1. See also comment on 565.6γ.
679.3	3.0 *3*	4835.9	$(45/2^+)$	4156.6	$(41/2^+)$	
680.0	0.95 *15*	4645.3	$43/2^+$	3965.2	$39/2^+$	I_γ: from gated spectra (table 1b of 1993Og01); 0.9 *3* in table 1a. DCO=0.95 *25*.
708.0	4.8 *5*	5202.9	$(47/2^+)$	4494.9	$(43/2^+)$	
713.4	6.0 *8*	4504.2	$45/2^-$	3790.7	$41/2^-$	
720.8	1.5 *2*	1699.5	$23/2^+$	978.7	$21/2^-$	
726.0[@]	1.2 *4*	5690.3?	$(49/2^+)$	4964.3	$(45/2^+)$	
726.7	0.62 *15*	5371.9	$47/2^+$	4645.3	$43/2^+$	I_γ: from gated spectra (table 1b of 1993Og01); 0.6 *3* in table 1a.
742.0	1.5 *2*	5577.9	$(49/2^+)$	4835.9	$(45/2^+)$	
757.1[@]	0.5 *2*	6129.0?	$(51/2^+)$	5371.9	$47/2^+$	
766.9	2.0 *3*	5271.1	$(49/2^-)$	4504.2	$45/2^-$	
772.0	2.6 *3*	5974.9	$(51/2^+)$	5202.9	$(47/2^+)$	
773.1	1.5 *2*	2198.1	$27/2^+$	1424.7	$25/2^-$	
775.7[@]	0.5 *1*	6904.7?	$(55/2^+)$	6129.0?	$(51/2^+)$	DCO=1.4 *3*.
803.2	1.16 *20*	2741.3	$31/2^+$	1938.1	$29/2^-$	
804.0	1.5 *3*	6382	$(53/2^+)$	5577.9	$(49/2^+)$	
821.7	1.6 *3*	6092.8	$(53/2^-)$	5271.1	$(49/2^-)$	
822.4	0.42 *10*	3330.3	$35/2^+$	2507.8	$33/2^-$	
839.0	0.43 *14*	3965.2	$39/2^+$	3126.1	$37/2^-$	
855.0	0.24 *5*	4645.3	$43/2^+$	3790.7	$41/2^-$	
867.6	≤0.11	5371.9	$47/2^+$	4504.2	$45/2^-$	
872.0	1.0 *2*	6965	$(57/2^-)$	6092.8	$(53/2^-)$	

[†] 1993Og01 do not state uncertainty in Eγ.
[‡] Photon intensity relative to I(189.0γ)=100.0.
[#] Based on DCO ratio measured with stretched Q transition In gate. Expected ratios are 1.0 for stretched Q (or D, ΔJ=0) transitions, 1 to 1.8 for stretched D transitions (depending on spin alignment); the proximity of values for ΔJ=2 and ΔJ=1 transitions makes it difficult to obtain definitive multipolarity assignments.
[@] Placement of transition in the level scheme is uncertain.

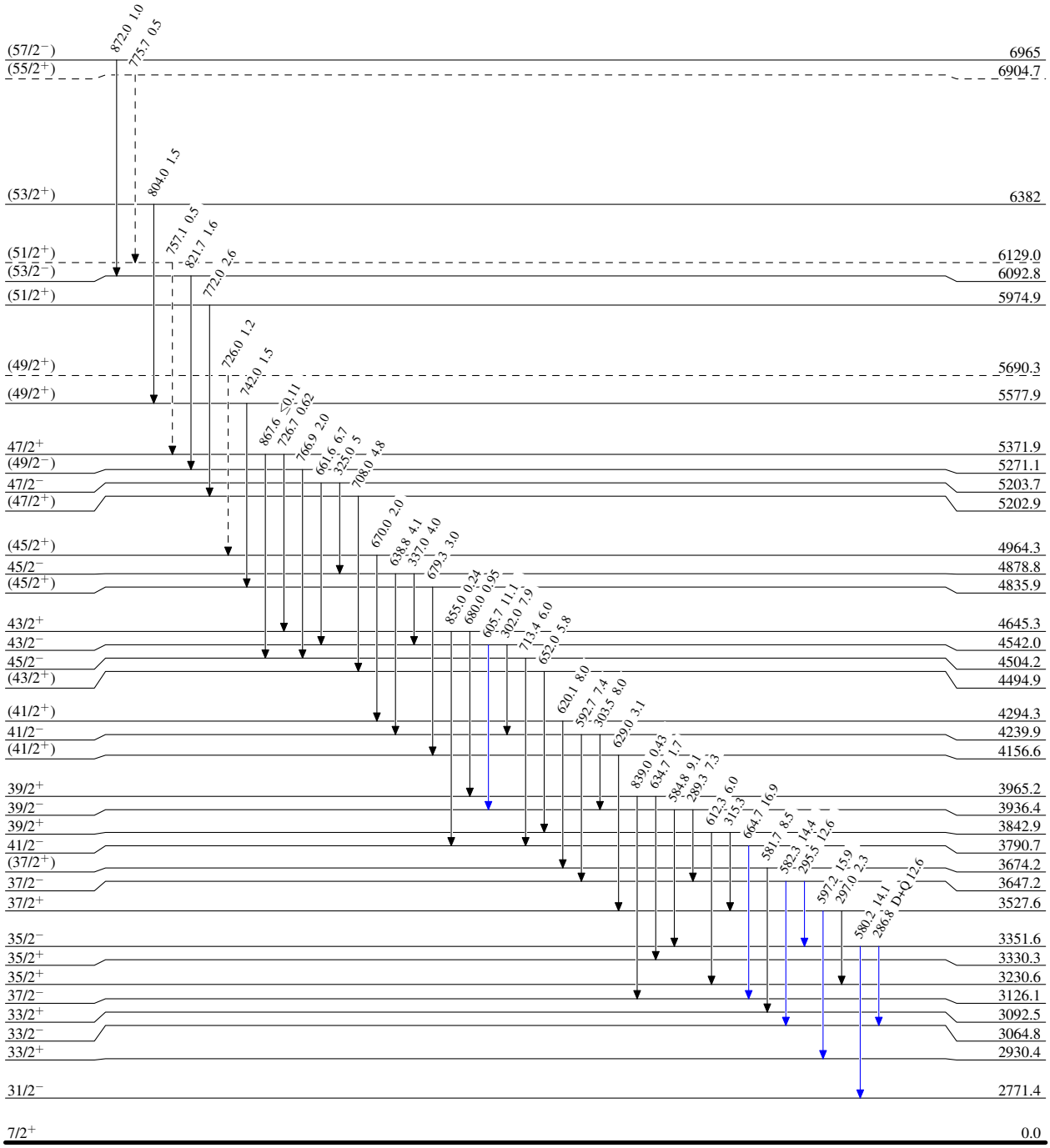
^{154}Sm(^{19}F,4nγ) 1993Og01

Level Scheme

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{169}_{71}Lu_{98}$

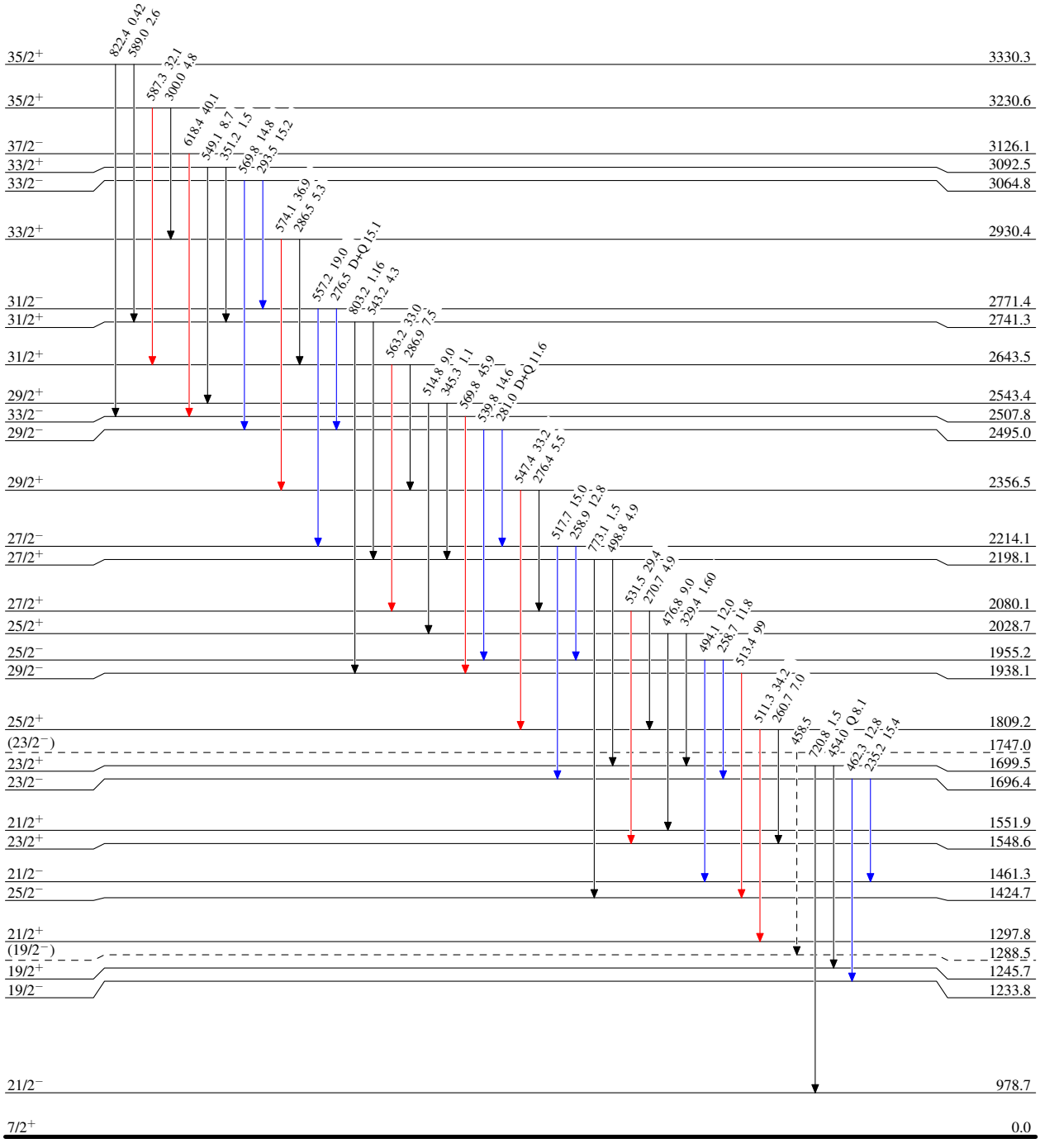
^{154}Sm(^{19}F,4nγ) 1993Og01

Level Scheme (continued)

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



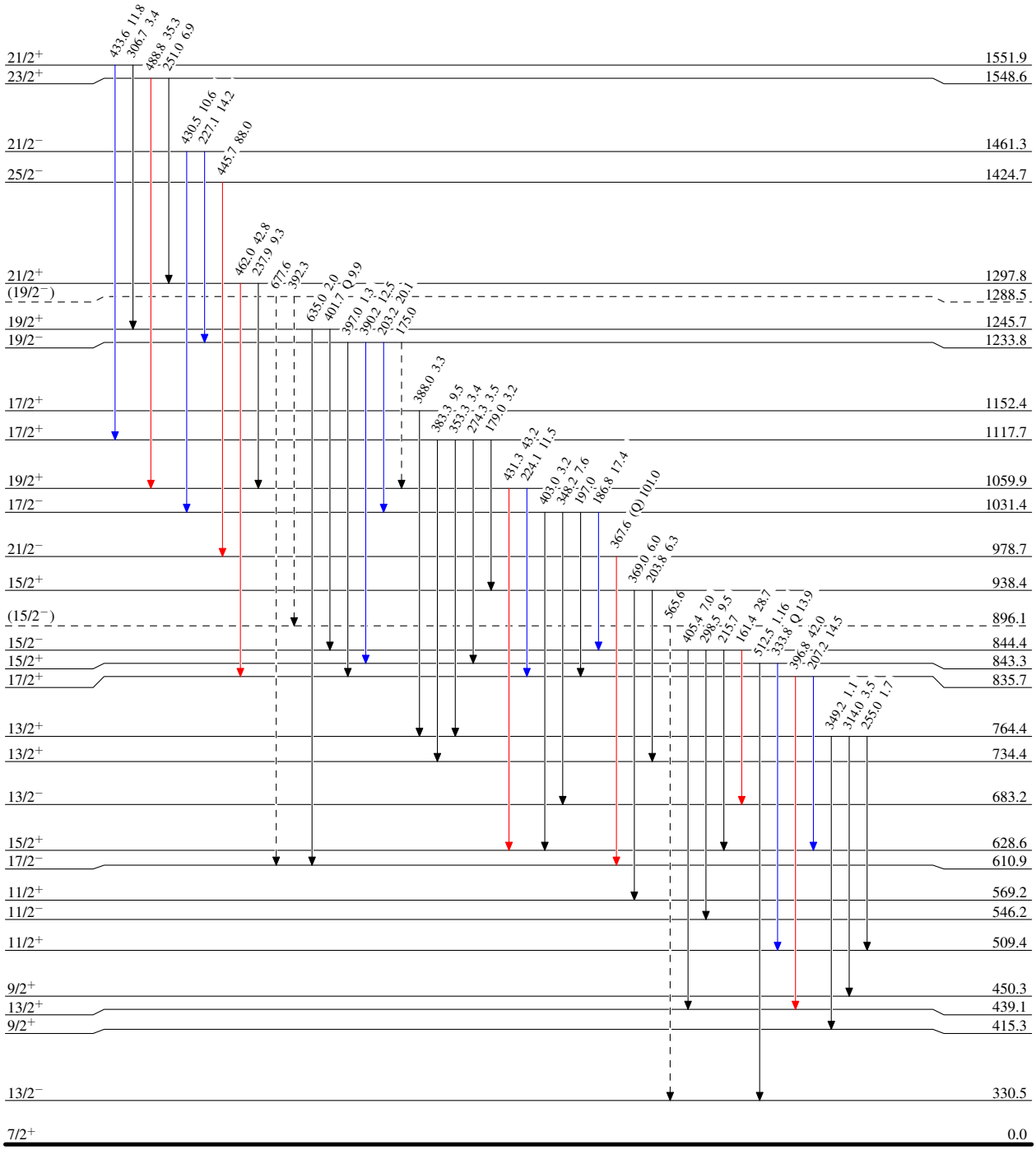
$^{169}_{71}Lu_{98}$

^{154}Sm(^{19}F,4nγ) 1993Og01

Level Scheme (continued)

Intensities: Relative I_γ

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



$^{169}_{71}Lu_{98}$

^{154}Sm(^{19}F,4nγ) **1993Og01**

Level Scheme (continued)

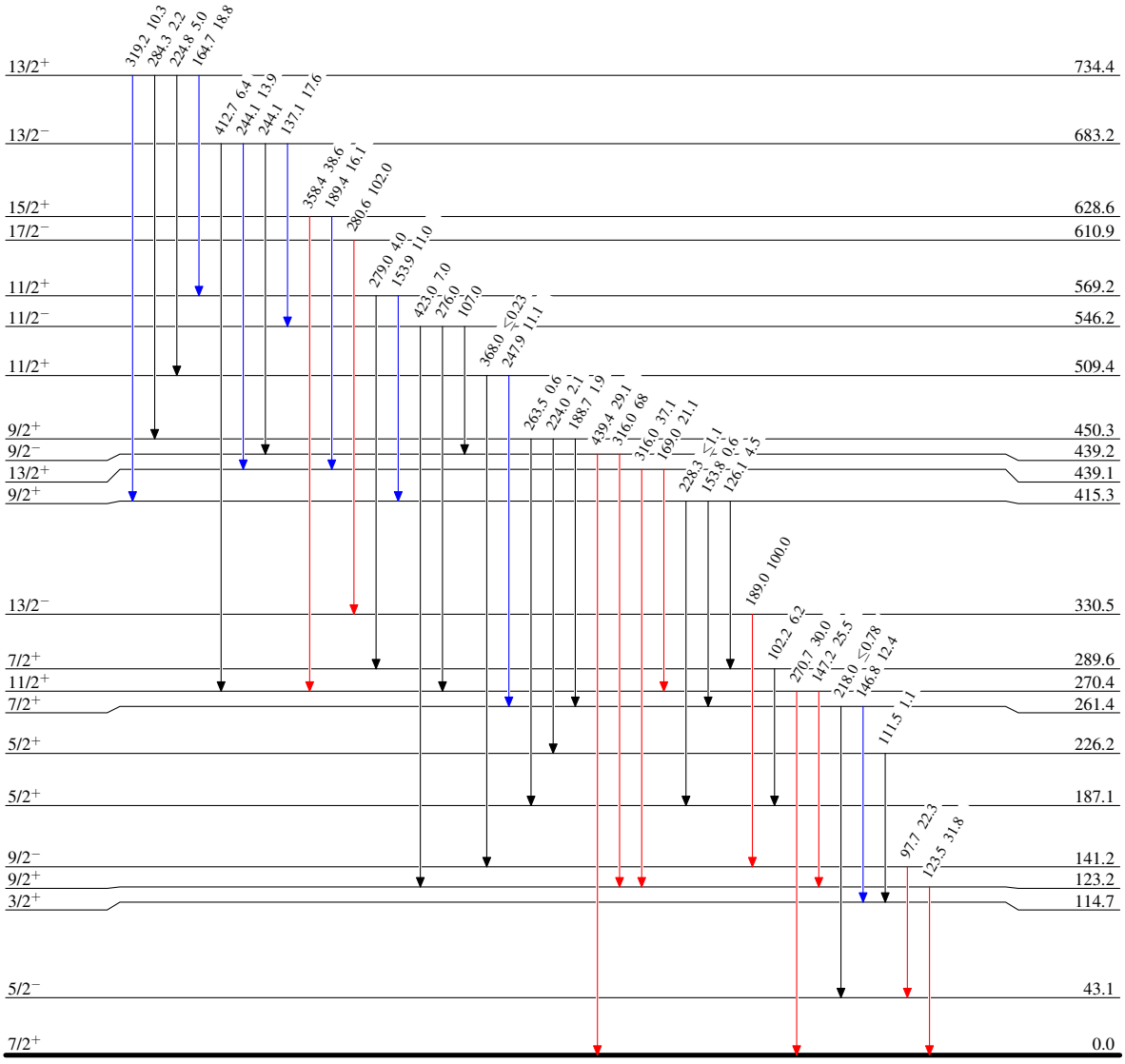
Intensities: Relative I_γ

Legend

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

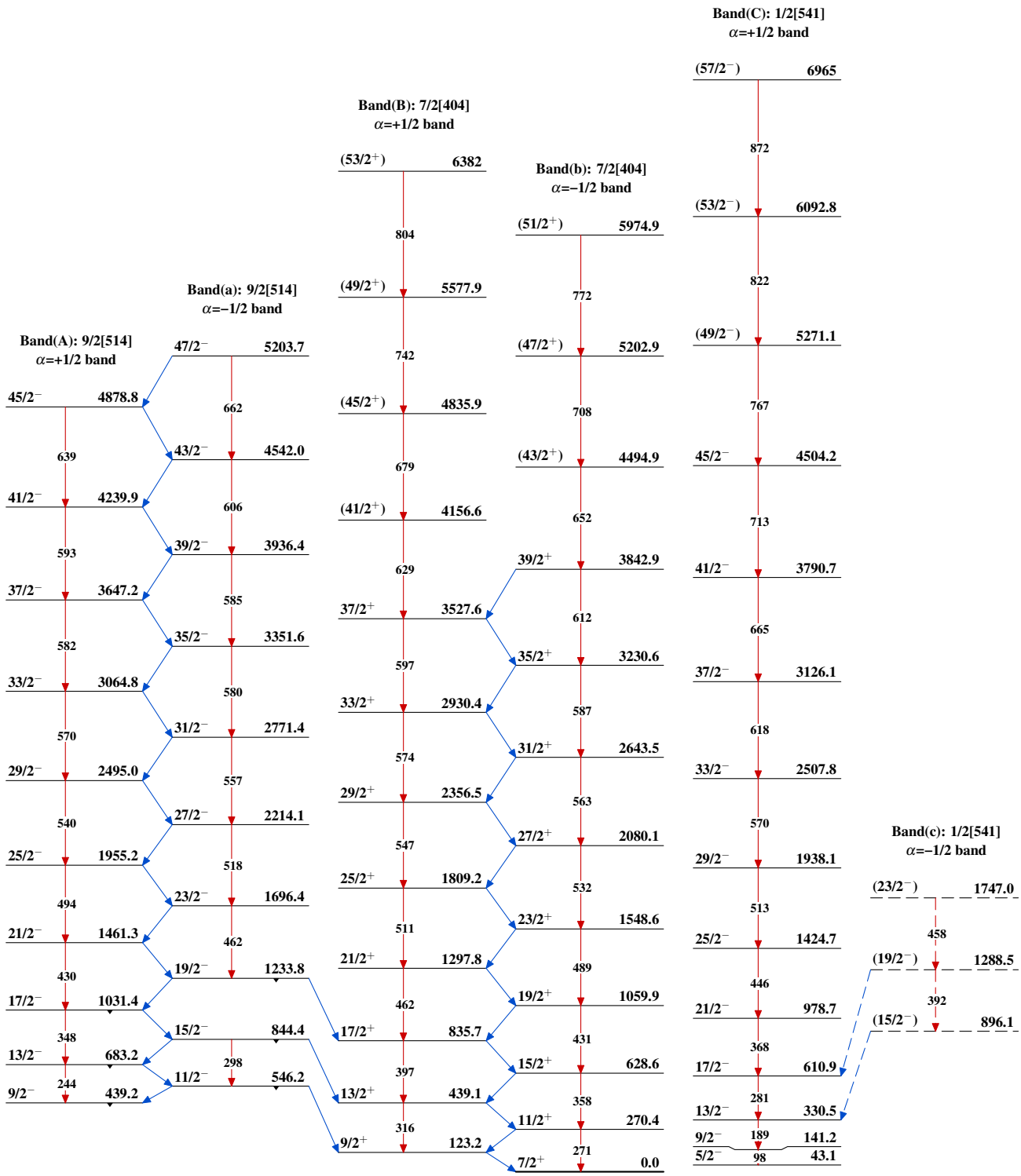
$I_\gamma < 10\% \times I_\gamma^{max}$

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



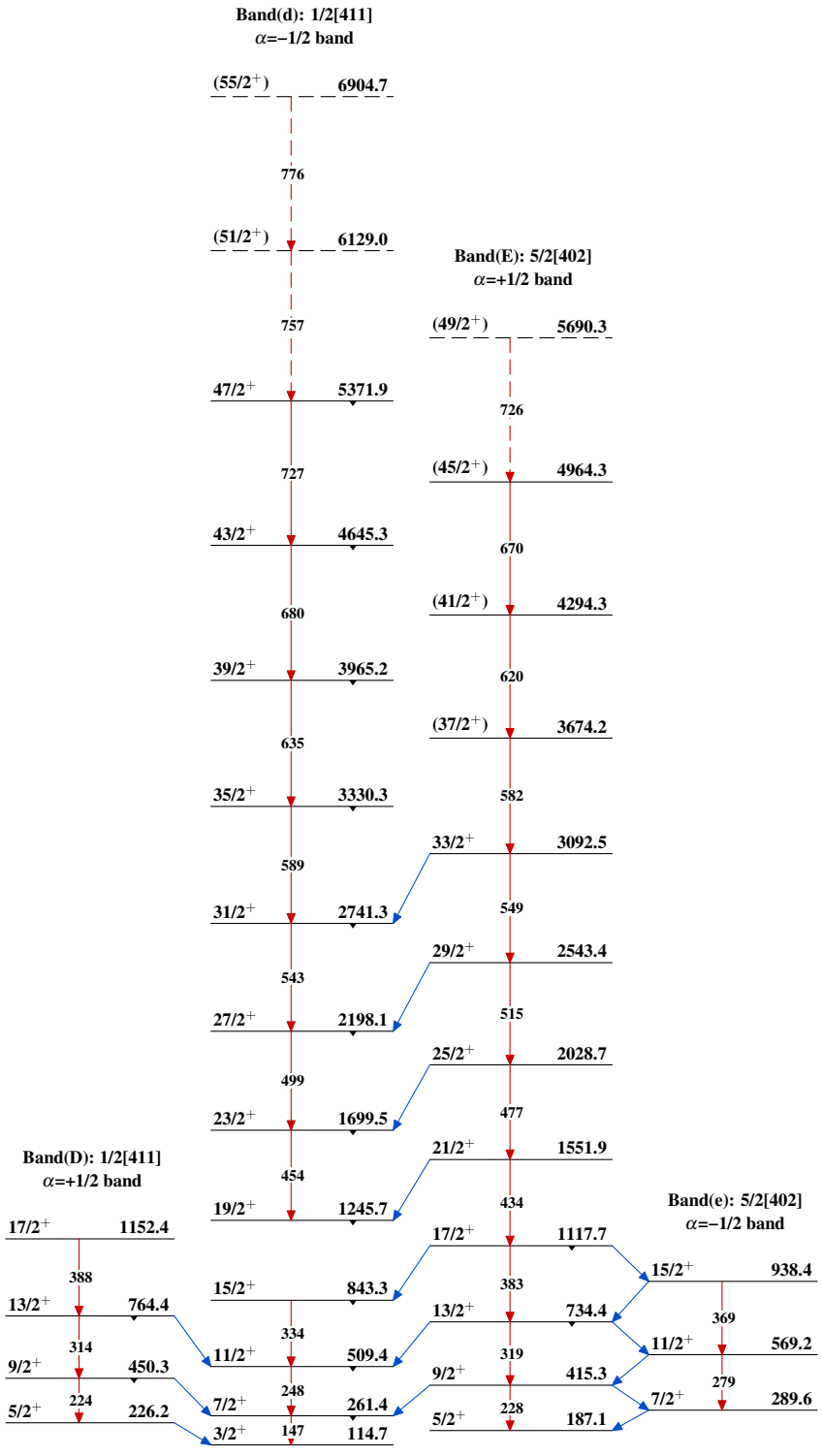
$^{169}_{71}Lu_{98}$

^{154}Sm(^{19}F,4nγ) 1993Og01



$^{169}_{71}Lu_{98}$

^{154}Sm(^{19}F,4nγ) 1993Og01 (continued)



$^{169}_{71}Lu_{98}$