^{139}La(^{13}C,3nγ) 1994Ur01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

1994Ur01 (also thesis by 1992JoZM): E(^{13}C)=58 MeV from Niels Bohr Institute accelerator for $\gamma\gamma$-coin measurement and from the KVI AVF cyclotron for γ(lin pol) measurements. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$(DCO), $\gamma\gamma$(lin pol), excitation functions. Deduced levels, J^π, γ-ray multipolarities. ^{136}Xe(^{19}F,6nγ),E=94 MeV also used to obtain $\gamma\gamma$-coin data.

Theoretical analysis of octupole correlations: 1994Jo09.

^{149}Eu Levels

E(level)[†]	J$^\pi$[#]	Comments
0.0	5/2$^+$	
149.8 2	7/2$^+$	This level interpreted by 1994Ur01 as $\pi g_{7/2}\otimes(^{150}$Gd core).
496.6[a] 4	11/2$^-$	
534.4 2	7/2$^+$	
666.5 2	9/2$^+$	
795.3[d] 5	9/2$^-$	
799.2 2	9/2$^+$	
911.3 3	11/2$^+$	
995.2[a] 5	15/2$^-$	
1060.2 5	11/2$^-$	J$^\pi$: (9/2$^-$,11/2,13/2$^-$) in the Adopted Levels.
1177.7[d] 4	13/2$^{(-)}$	
1185.0 2	11/2$^+$	
1334.1 3	13/2$^+$	
1472.2 3	13/2$^+$	
1529.4[c] 5	15/2$^+$	
1610.8[a] 5	19/2$^-$	
1659.9 3	15/2$^+$	
1744.2 6	15/2$^+$	
1765.3[d] 5	17/2$^-$	
1834.4 4	15/2$^+$	
1899.6?[b] 5	17/2$^+$	
1999.0 4	17/2$^+$	
2000.0[c] 5	19/2$^+$	
2063.1 4	17/2$^+$	
2181.5 5	19/2$^-$	
2247.4 6	19/2$^+$	
2336.5[a] 5	23/2$^-$	
2343.5[b] 5	21/2$^+$	
2396.7 4	19/2$^+$	
2454.1[d] 5	21/2$^-$	
2497.9 5	23/2$^-$	
2562.9[c] 5	23/2$^+$	
2577.7 5	25/2$^-$	
2609.6 4	21/2$^+$	
2753.0 5	27/2$^-$	
2828.9[b] 5	25/2$^+$	
3144.8[a] 5	27/2$^-$	
3219.7[c] 5	27/2$^+$	
3250.0[b] 5	29/2$^+$	
3428.7 5	31/2$^-$	
3443.4 3	29/2$^-$	
3543.4 6	31/2$^+$	

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^{139}La(^{13}C,3nγ) 1994Ur01 (continued)

^{149}Eu Levels (continued)

E(level)[†]	J$^\pi$[#]	Comments
3617.2 *5*	33/2$^+$	
3951.4[a] *6*	(31/2$^-$)	Parity from the Adopted Levels.
3992.4[c] *6*	(31/2$^+$)	
4100.7[b] *6*	(33/2$^+$)	J$^\pi$: from the Adopted Levels. 1994Ur01 assign (33/2).
4189.3 *6*	35/2$^-$	
4223.3 *6*	35/2$^+$	
4272.4 *6*	(33/2$^-$)	
4360.6 *6*	37/2$^+$	
4405.2 *6*		
4423.2 *6*		
4685.4[‡a] *6*	(35/2$^-$)	
4706.1 *6*		
4970.8 *7*	39/2$^+$	
4996.1[b] *7*	(37/2$^+$)	Parity from the Adopted Levels.
5050.6 *7*	41/2$^+$	
5071.0 *6*	(37/2)[@]	
5168.8 *7*	(37/2)	
5339.0 *7*	(39/2)	
5374.7?[a] *6*		
5539.4 *7*	45/2$^+$	
5608.6 *7*	(39/2)	
5964.3 *7*	(41/2)	
6031? *1*		
6289.9 *8*	(47/2$^+$)	
6810.2 *8*	(49/2)	
6997.6 *8*	(51/2$^+$)	
7028.4 *8*	[&]	
7684.9 *8*	(55/2$^+$)	

[†] From a least-squares fit to γ-ray energies, assuming $\Delta E\gamma$=0.3 keV for Eγ values quoted to tenth of a keV and 1 keV otherwise.
[‡] The 35/2$^-$ band member is the 4685 or 4706 level.
[#] As given by 1994Ur01, based on $\gamma\gamma(\theta)$(DCO) and $\gamma\gamma$(lin pol) data, and association with band structures. The J^π assignments for high-spin levels in the Adopted Levels are mostly from this work, except that many are placed in parentheses there when strong arguments seem lacking. Exceptions are noted.
[@] 1994Ur01 suggest 37/2.
[&] 1994Ur01 suggest 49/2.
[a] Band(A): $\pi h_{11/2}\otimes(^{148}$Sm core).
[b] Band(B): $\pi h_{11/2}\otimes(3^-)$ octupole band #1.
[c] Band(C): $\pi h_{11/2}\otimes(3^-)$ octupole band #2.
[d] Band(D): Decoupled $\pi h_{11/2}$ band.

$\gamma(^{149}$Eu)

R(DCO)=Iγ(A)/Iγ(B), where Iγ(A) is from coin between a (known) stretched E2 γ ray measured at 37° and the unknown γ ray at 90° and Iγ(B) is from coin between a (known) stretched E2 γ ray measured at 90° and the unknown γ ray at 37°. The angles are with respect to the beam axis. Expected R(DCO) values are ≈1.7 and ≈1.0 for stretched dipole and quadrupole transitions, respectively.

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^{139}La(^{13}C,3nγ) 1994Ur01 (continued)

γ(^{149}Eu) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
30.3		3250.0	$29/2^+$	3219.7	$27/2^+$		M1+E2 in 1994Ur01.
73.2		3617.2	$33/2^+$	3543.4	$31/2^+$		M1+E2 in 1994Ur01.
79.9	0.3 *1*	2577.7	$25/2^-$	2497.9	$23/2^-$		M1+E2 in 1994Ur01.
105.1	0.8 *2*	3250.0	$29/2^+$	3144.8	$27/2^-$	D	DCO=1.8 *4* E1 in 1994Ur01.
109.0	0.4 *2*	2562.9	$23/2^+$	2454.1	$21/2^-$		(E1) in 1994Ur01.
117.6	0.3 *1*	1177.7	$13/2^{(-)}$	1060.2	$11/2^-$		(M1+E2) in 1994Ur01.
131.9	0.4[‡] *2*	666.5	$9/2^+$	534.4	$7/2^+$		M1+E2 in 1994Ur01.
137.4	0.5 *2*	4360.6	$37/2^+$	4223.3	$35/2^+$		M1+E2 in 1994Ur01.
149.2	0.4 *1*	1334.1	$13/2^+$	1185.0	$11/2^+$		M1+E2 in 1994Ur01.
149.8	4.8 *6*	149.8	$7/2^+$	0.0	$5/2^+$		pol=−0.01 *16* M1+E2 in 1994Ur01.
154.6	0.4 *2*	1765.3	$17/2^-$	1610.8	$19/2^-$		M1+E2 in 1994Ur01.
161.5	0.5 *1*	2497.9	$23/2^-$	2336.5	$23/2^-$	D+Q	DCO=1.0 *4* M1+E2 in 1994Ur01.
171.4	0.6 *2*	4360.6	$37/2^+$	4189.3	$35/2^-$		E1 in 1994Ur01.
175.3	35.8 *11*	2753.0	$27/2^-$	2577.7	$25/2^-$	M1(+E2)	DCO=2.21 *5*; pol=−0.16 *6* M1+E2 in 1994Ur01.
182.4	0.8 *3*	1177.7	$13/2^{(-)}$	995.2	$15/2^-$	D	DCO=2.1 *5* M1+E2 in 1994Ur01.
184	0.5 *2*	2247.4	$19/2^+$	2063.1	$17/2^+$		M1+E2 in 1994Ur01.
187.5	0.6 *2*	6997.6	$(51/2^+)$	6810.2	(49/2)		
188.7	6.4 *5*	3617.2	$33/2^+$	3428.7	$31/2^-$	E1	DCO=2.24 *11*; pol=+0.21 *9*
212.8	0.6 *2*	2609.6	$21/2^+$	2396.7	$19/2^+$	D+Q	DCO=1.6 *2* M1+E2 in 1994Ur01.
219	0.3 *1*	2562.9	$23/2^+$	2343.5	$21/2^+$		(M1+E2) in 1994Ur01.
226.3	0.6 *2*	2562.9	$23/2^+$	2336.5	$23/2^-$	E1	DCO=0.8 *3*; pol=−0.37 *25*
228.7	0.5 *2*	2063.1	$17/2^+$	1834.4	$15/2^+$		M1+E2 in 1994Ur01.
234.7	1.8 *2*	2000.0	$19/2^+$	1765.3	$17/2^-$	D	DCO=1.9 *2* E1 in 1994Ur01.
235.8	0.3 *1*	1765.3	$17/2^-$	1529.4	$15/2^+$		E1 in 1994Ur01.
241.1	40.5 *12*	2577.7	$25/2^-$	2336.5	$23/2^-$	M1+E2	DCO=1.92 *3*; pol=−0.32 *5*
244.8	1.7[‡] *4*	911.3	$11/2^+$	666.5	$9/2^+$	D	DCO=1.7 *3* M1+E2 in 1994Ur01.
255.1	3.3 *5*	2753.0	$27/2^-$	2497.9	$23/2^-$	E2	DCO=1.2 *1*; pol=+0.63 *21*
262.2	0.6 *2*	4685.4	$(35/2^-)$	4423.2			
264.8	1.0 *3*	799.2	$9/2^+$	534.4	$7/2^+$		M1+E2 in 1994Ur01.
265.0	0.5 *2*	1060.2	$11/2^-$	795.3	$9/2^-$		M1+E2 in 1994Ur01.
266.0	4.9 *9*	2828.9	$25/2^+$	2562.9	$23/2^+$	M1+E2	DCO=1.65 *9*; pol=−0.19 *13*
280.3	0.4 *1*	4685.4	$(35/2^-)$	4405.2			
287.2	0.4 *2*	1472.2	$13/2^+$	1185.0	$11/2^+$		M1+E2 in 1994Ur01.
293.3	21.2 *9*	3543.4	$31/2^+$	3250.0	$29/2^+$	M1(+E2)	DCO=2.19 *3*; pol=−0.23 *5* M1+E2 in 1994Ur01.
298.8	1.5 *3*	795.3	$9/2^-$	496.6	$11/2^-$		M1+E2 in 1994Ur01.
316.0	0.5 *1*	3144.8	$27/2^-$	2828.9	$25/2^+$		E1 in 1994Ur01.
316.5	0.4 *1*	2497.9	$23/2^-$	2181.5	$19/2^-$		E2 in 1994Ur01.
319	0.5 *2*	2063.1	$17/2^+$	1744.2	$15/2^+$		M1+E2 in 1994Ur01.
323.5	1.0 *3*	3543.4	$31/2^+$	3219.7	$27/2^+$	(Q)	DCO=1.2 *2* E2 in 1994Ur01.
325.7	0.4 *2*	1659.9	$15/2^+$	1334.1	$13/2^+$		M1+E2 in 1994Ur01.
334	0.3 *1*	2396.7	$19/2^+$	2063.1	$17/2^+$		M1+E2 in 1994Ur01.
339.2	0.4 *2*	1999.0	$17/2^+$	1659.9	$15/2^+$		M1+E2 in 1994Ur01.
343.5	0.8 *2*	2343.5	$21/2^+$	2000.0	$19/2^+$	M1+E2	DCO=0.9 *3*; pol=−0.42 *26*
346.8		496.6	$11/2^-$	149.8	$7/2^+$		pol=−0.06 *9* M2 in 1994Ur01.

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^{139}La(^{13}C,3nγ) 1994Ur01 (continued)

γ(^{149}Eu) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
351.5	4.2 *5*	1529.4	15/2$^+$	1177.7	13/2$^{(-)}$		E1 in 1994Ur01.
356[@]	0.3 *1*	5964.3	(41/2)	5608.6	(39/2)		
362	0.3 *1*	2609.6	21/2$^+$	2247.4	19/2$^+$		(M1+E2) in 1994Ur01.
362.2	0.4 *2*	1834.4	15/2$^+$	1472.2	13/2$^+$		M1+E2 in 1994Ur01.
367.3	3.5 *4*	3617.2	33/2$^+$	3250.0	29/2$^+$	E2	DCO=0.8 *1*; pol=+0.18 *15*
371[@]	0.3 *1*	1899.6?	17/2$^+$	1529.4	15/2$^+$		(M1+E2) in 1994Ur01.
382.5	0.7 *2*	1177.7	13/2$^{(-)}$	795.3	9/2$^-$		E2 in 1994Ur01.
384.5	0.4[‡] *1*	534.4	7/2$^+$	149.8	7/2$^+$		M1+E2 in 1994Ur01.
385.6	0.5 *2*	5071.0	(37/2)	4685.4	(35/2$^-$)		
385.9	0.7 *3*	1185.0	11/2$^+$	799.2	9/2$^+$	D	DCO=2.2 *5* M1+E2 in 1994Ur01.
389.1	5.0 *4*	2000.0	19/2$^+$	1610.8	19/2$^-$	E1	DCO=1.03 *8*; pol=−0.72 *14* Mult.: DCO and pol values are consistent with ΔJ=0, E1 transition.
390.6	0.3 *1*	3219.7	27/2$^+$	2828.9	25/2$^+$		M1+E2 in 1994Ur01.
398	0.4 *1*	2396.7	19/2$^+$	1999.0	17/2$^+$		M1+E2 in 1994Ur01.
410	0.8 *2*	1744.2	15/2$^+$	1334.1	13/2$^+$		M1+E2 in 1994Ur01.
416.5	0.3 *1*	2753.0	27/2$^-$	2336.5	23/2$^-$		E2 in 1994Ur01.
421.0	16.0 *8*	3250.0	29/2$^+$	2828.9	25/2$^+$	E2	DCO=1.06 *5*; pol=+0.41 *10*
422.9	0.9 *3*	1334.1	13/2$^+$	911.3	11/2$^+$	D	DCO=2.1 *4* M1+E2 in 1994Ur01.
444.0	0.3 *1*	2343.5	21/2$^+$	1899.6?	17/2$^+$		(E2) in 1994Ur01.
454.0	0.4 *2*	2454.1	21/2$^-$	2000.0	19/2$^+$		E1 in 1994Ur01.
470.5	9.1 *6*	2000.0	19/2$^+$	1529.4	15/2$^+$	E2	DCO=0.98 *7*; pol=+0.67 *12*
485.4	2.9 *5*	2828.9	25/2$^+$	2343.5	21/2$^+$	(Q)	DCO=1.3 *2* E2 in 1994Ur01.
488.8	7.8 *6*	5539.4	45/2$^+$	5050.6	41/2$^+$	E2	DCO=0.93 *9*; pol=+0.90 *24*
492.4	12.4 *4*	2828.9	25/2$^+$	2336.5	23/2$^-$	E1	DCO=1.90 *4*; pol=+0.28 *8*
496	0.5 *2*	4685.4	(35/2$^-$)	4189.3	35/2$^-$		(M1+E2) in 1994Ur01.
497.0	24.6 *21*	3250.0	29/2$^+$	2753.0	27/2$^-$	(E1)	DCO=0.93 *8*; pol=+0.31 *13* DCO is inconsistent with ΔJ=1, dipole, while it is typical value ΔJ=2, quadrupole or ΔJ=0, dipole. E1 in 1994Ur01.
498.6	100.0 *22*	995.2	15/2$^-$	496.6	11/2$^-$	(E2)	pol=+0.42 *7* E2 in 1994Ur01.
500	0.3 *1*	1834.4	15/2$^+$	1334.1	13/2$^+$		M1+E2 in 1994Ur01.
503	0.4 *2*	2247.4	19/2$^+$	1744.2	15/2$^+$		(E2) in 1994Ur01.
516.8	1.6[‡] *3*	666.5	9/2$^+$	149.8	7/2$^+$		M1+E2 in 1994Ur01.
518.5	0.6 *2*	1185.0	11/2$^+$	666.5	9/2$^+$		M1+E2 in 1994Ur01.
534.2	8.8 *6*	1529.4	15/2$^+$	995.2	15/2$^-$	E1	DCO=1.01 *7*; pol=−0.45 *12* Mult.: for ΔJ=0 transition, DCO value and pol are consistent with mult=E1.
534.5	1.5[‡] *5*	534.4	7/2$^+$	0.0	5/2$^+$		E1 in 1994Ur01.
563.0	13.0 *8*	2562.9	23/2$^+$	2000.0	19/2$^+$	E2	DCO=1.06 *5*; pol=+0.29 *9*
570.8	0.7 *3*	2181.5	19/2$^-$	1610.8	19/2$^-$	(M1)	pol=−0.48 *33* M1+E2 in 1994Ur01.
587.7	0.6 *2*	1765.3	17/2$^-$	1177.7	13/2$^{(-)}$		E2 in 1994Ur01.
588	0.4 *2*	2247.4	19/2$^+$	1659.9	15/2$^+$		(E2) in 1994Ur01.
610.7	0.5 *3*	2609.6	21/2$^+$	1999.0	17/2$^+$		(E2) in 1994Ur01.
615.6	89.5 *23*	1610.8	19/2$^-$	995.2	15/2$^-$	E2	DCO=1.01 *1*; pol=+0.50 *7*
649	0.5 *2*	1834.4	15/2$^+$	1185.0	11/2$^+$		E2 in 1994Ur01.
650.8	1.2 *4*	1185.0	11/2$^+$	534.4	7/2$^+$		E2 in 1994Ur01.
656.7	6.3 *6*	3219.7	27/2$^+$	2562.9	23/2$^+$	E2	DCO=1.2 *1*; pol=+0.42 *22*
664.8	1.0 *4*	1999.0	17/2$^+$	1334.1	13/2$^+$	(Q)	DCO=1.1 *3* E2 in 1994Ur01.

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^{139}La(^{13}C,3nγ) 1994Ur01 (continued)

γ(^{149}Eu) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
666.5	1.4 [‡] *4*	666.5	$9/2^+$	0.0	$5/2^+$		E2 in 1994Ur01.
667.5	1.2 *3*	1334.1	$13/2^+$	666.5	$9/2^+$		E2 in 1994Ur01.
672.9	0.7 *2*	1472.2	$13/2^+$	799.2	$9/2^+$	Q	DCO=0.7 *3* E2 in 1994Ur01.
675.7	22.7 *11*	3428.7	$31/2^-$	2753.0	$27/2^-$	E2	DCO=1.02 *3*; pol=+0.52 *10*
680.0	9.0 *8*	4223.3	$35/2^+$	3543.4	$31/2^+$	E2	DCO=1.05 *6*; pol=+0.32 *7*
681.0	3.2 *4*	1177.7	$13/2^{(-)}$	496.6	$11/2^-$		M1+E2 in 1994Ur01.
687.3	1.2 *4*	7684.9	$(55/2^+)$	6997.6	$(51/2^+)$	(Q)	DCO=0.7 *4* (E2) in 1994Ur01.
689.0	0.5 *2*	2454.1	$21/2^-$	1765.3	$17/2^-$		E2 in 1994Ur01.
689.3	0.6 *3*	5374.7?		4685.4	$(35/2^-)$		
690.0	13.1 *7*	5050.6	$41/2^+$	4360.6	$37/2^+$	E2	DCO=1.02 *4*; pol=+0.57 *14*
692	0.6 *3*	6031?		5339.0	(39/2)		
707.7	2.5 *6*	6997.6	$(51/2^+)$	6289.9	$(47/2^+)$	(E2)	DCO=0.9 *2*; pol=+0.31 *30*
725.7	79.0 *21*	2336.5	$23/2^-$	1610.8	$19/2^-$	E2	DCO=0.99 *1* pol=+0.36 *10*
729.0	0.5 *2*	2063.1	$17/2^+$	1334.1	$13/2^+$		M1+E2 in 1994Ur01, but from their ΔJ^π, mult should be E2.
732.7	3.8 *4*	2343.5	$21/2^+$	1610.8	$19/2^-$	D	DCO=1.2 *1* E1 in 1994Ur01.
733.8	1.2 *3*	4685.4	$(35/2^-)$	3951.4	$(31/2^-)$		(E2) in 1994Ur01.
736.7	0.7 *2*	2396.7	$19/2^+$	1659.9	$15/2^+$	(Q)	DCO=1.0 *4* E2 in 1994Ur01.
743.3	16.9 *10*	4360.6	$37/2^+$	3617.2	$33/2^+$	E2	DCO=1.00 *3*; pol=+0.57 *15*
747.5	4.9 *7*	4970.8	$39/2^+$	4223.3	$35/2^+$	E2	DCO=1.0 *1*; pol=+0.39 *18*
748.6	1.5 *4*	1659.9	$15/2^+$	911.3	$11/2^+$	Q	DCO=1.12 *8* E2 in 1994Ur01.
750.4	1.8 *3*	6289.9	$(47/2^+)$	5539.4	$45/2^+$	D(+Q)	DCO=2.1 *3*; pol=−0.01 *14* (M1+E2) in 1994Ur01.
755.1	0.5 *2*	4706.1		3951.4	$(31/2^-)$		
760.7	6.6 *7*	4189.3	$35/2^-$	3428.7	$31/2^-$	E2	DCO=1.06 *6*; pol=+0.25 *18*
761.5	2.2 [‡] *4*	911.3	$11/2^+$	149.8	$7/2^+$		Mult.: 1994Ur01 use this transition as a reference E2 transition.
770.1	1.2 *3*	1765.3	$17/2^-$	995.2	$15/2^-$	(M1)	pol=−0.5 *4* M1+E2 in 1994Ur01.
772.7	0.9 *3*	3992.4	$(31/2^+)$	3219.7	$27/2^+$	(Q)	DCO=1.2 *3* (E2) in 1994Ur01.
795.4	3.2 *4*	5964.3	(41/2)	5168.8	(37/2)	(Q)	DCO=1.3 *1* (E2) in 1994Ur01.
799.1	1.3 *3*	799.2	$9/2^+$	0.0	$5/2^+$		E2 in 1994Ur01.
806.8	3.3 *6*	3951.4	$(31/2^-)$	3144.8	$27/2^-$	(Q)	DCO=1.2 *1* E2 in 1994Ur01.
808.3	6.2 *6*	3144.8	$27/2^-$	2336.5	$23/2^-$	E2	DCO=1.02 *8*; pol=+0.59 *26*
829.0	2.2 *4*	4272.4	$(33/2^-)$	3443.4	$29/2^-$	(Q)	DCO=0.9 *1* (E2) in 1994Ur01.
833	0.4 *1*	1744.2	$15/2^+$	911.3	$11/2^+$		(E2) in 1994Ur01.
850.7	2.1 *3*	4100.7	$(33/2^+)$	3250.0	$29/2^+$	(E2)	DCO=1.2 *1*; pol=+0.67 *32*
865.8	4.9 *9*	3443.4	$29/2^-$	2577.7	$25/2^-$	E2	DCO=0.91 *6*; pol=+0.31 *20*
887.1	11.4 *4*	2497.9	$23/2^-$	1610.8	$19/2^-$	(E2)	DCO=1.2 *1*; pol=+0.1 *4* E2 in 1994Ur01.
895.4	1.5 *3*	4996.1	$(37/2^+)$	4100.7	$(33/2^+)$	(Q)	DCO=0.9 *2* (E2) in 1994Ur01.
904.3	0.5 *1*	1899.6?	$17/2^+$	995.2	$15/2^-$		(E1) in 1994Ur01.
961.8	1.1 *3*	4405.2		3443.4	$29/2^-$	(Q)	DCO=1.1 *2*
979.5	1.4 *3*	5168.8	(37/2)	4189.3	$35/2^-$	D+Q	DCO=1.5 *3* (M1+E2) in 1994Ur01.

Continued on next page (footnotes at end of table)

^{139}La(^{13}C,3nγ) 1994Ur01 (continued)

γ(^{149}Eu) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
979.8	1.6 *4*	4423.2		3443.4	29/2$^-$	(Q)	DCO=1.2 *2*
1149.7	0.7 *2*	5339.0	(39/2)	4189.3	35/2$^-$	(Q)	DCO=0.8 *3* (E2) in 1994Ur01.
1186.2	0.9 *2*	2181.5	19/2$^-$	995.2	15/2$^-$	(Q)	DCO=0.9 *2* E2 in 1994Ur01.
1256.9	0.7 *3*	4685.4	(35/2$^-$)	3428.7	31/2$^-$	(Q)	DCO=0.9 *4* (E2) in 1994Ur01.
1270.8	0.5 *2*	6810.2	(49/2)	5539.4	45/2$^+$		(E2) in 1994Ur01.
1277.0	0.5 *2*	4706.1		3428.7	31/2$^-$		
1419.3	0.6 *2*	5608.6	(39/2)	4189.3	35/2$^-$	(Q)	DCO=1.1 *3* (E2) in 1994Ur01.
1489.0	0.7 *2*	7028.4		5539.4	45/2$^+$		

[†] From 1994Ur01.
[‡] Branching ratio disagrees with that in the Adopted Gammas.
[#] From $\gamma\gamma(\theta)$(DCO) and $\gamma\gamma$(linear polarization) in 1994Ur01. The assignments given here are not necessarily those given by 1994Ur01. but from a reassessment (by the evaluators) of the correlation and polarization coefficients given by 1994Ur01. For Mult=Q, E2 is more likely than M2 from systematics and from no evidence of long-lived states, but the present data cannot give a unique assignment. Assignments in Table 1 of 1994Ur01, many of which are simply from ΔJ^π, are listed in comments.
[@] Placement of transition in the level scheme is uncertain.

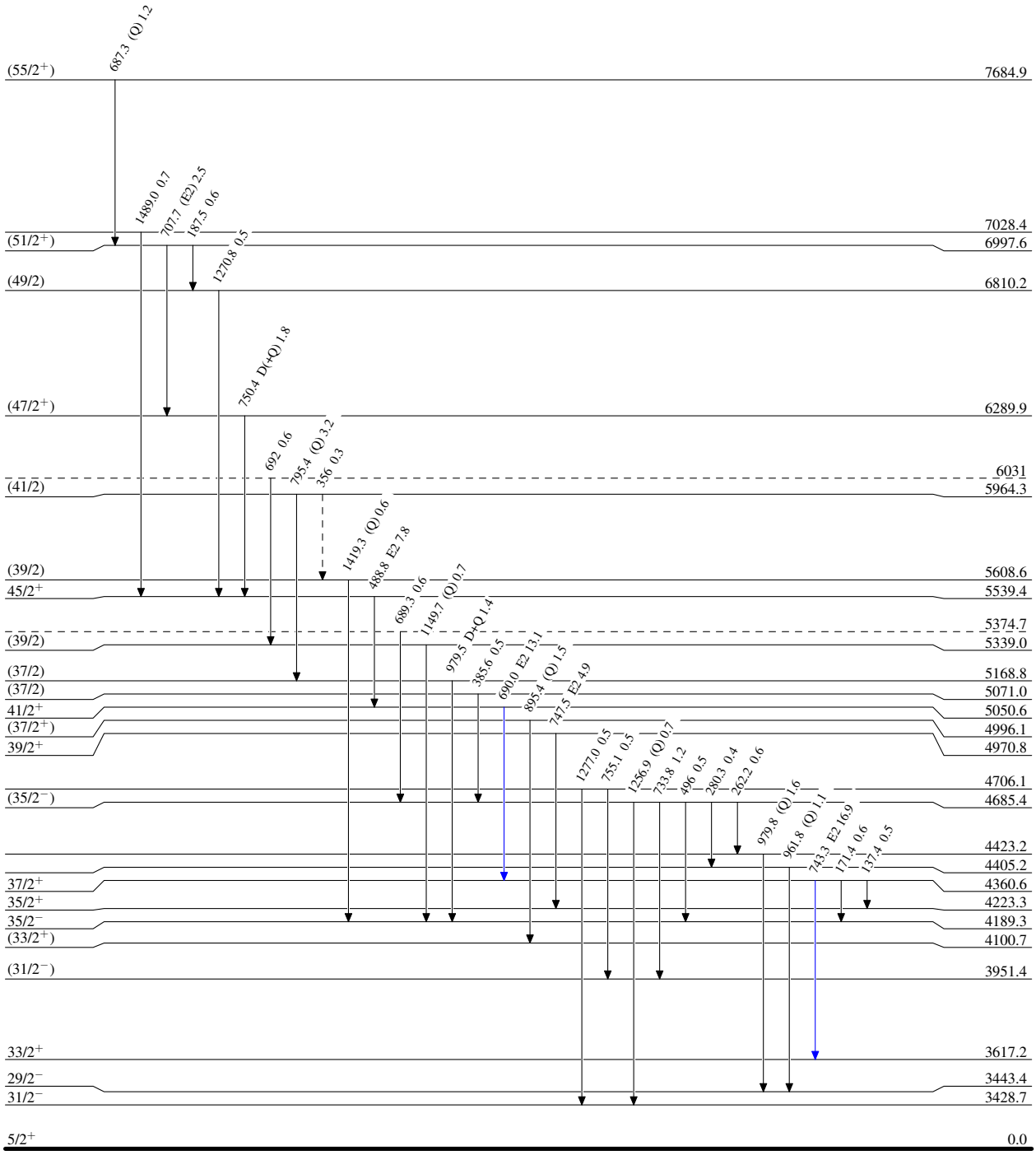
^{139}La(^{13}C,3nγ) 1994Ur01

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)

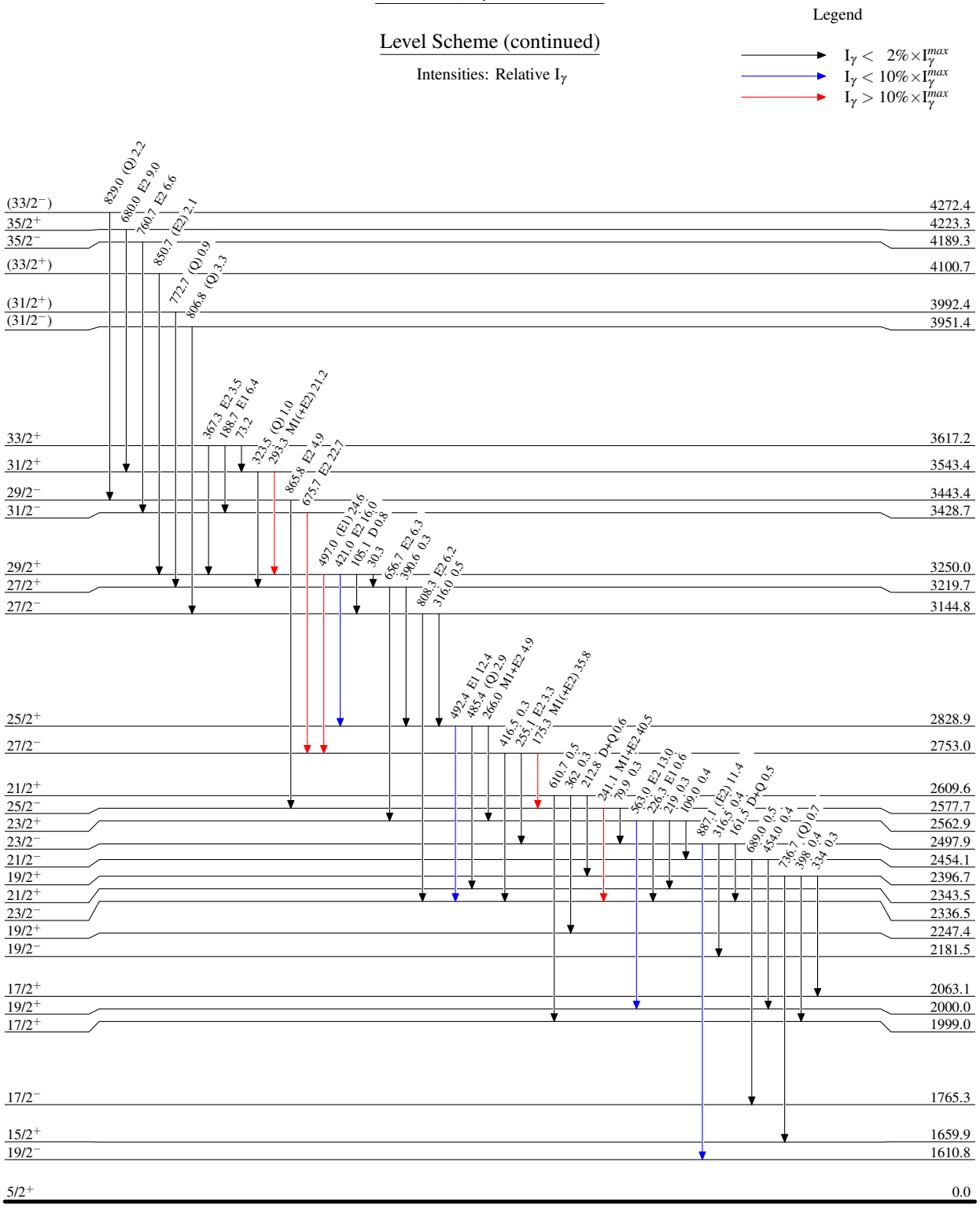


$^{149}_{63}Eu_{86}$

^{139}La(^{13}C,3nγ) 1994Ur01

Level Scheme (continued)

Intensities: Relative I_γ

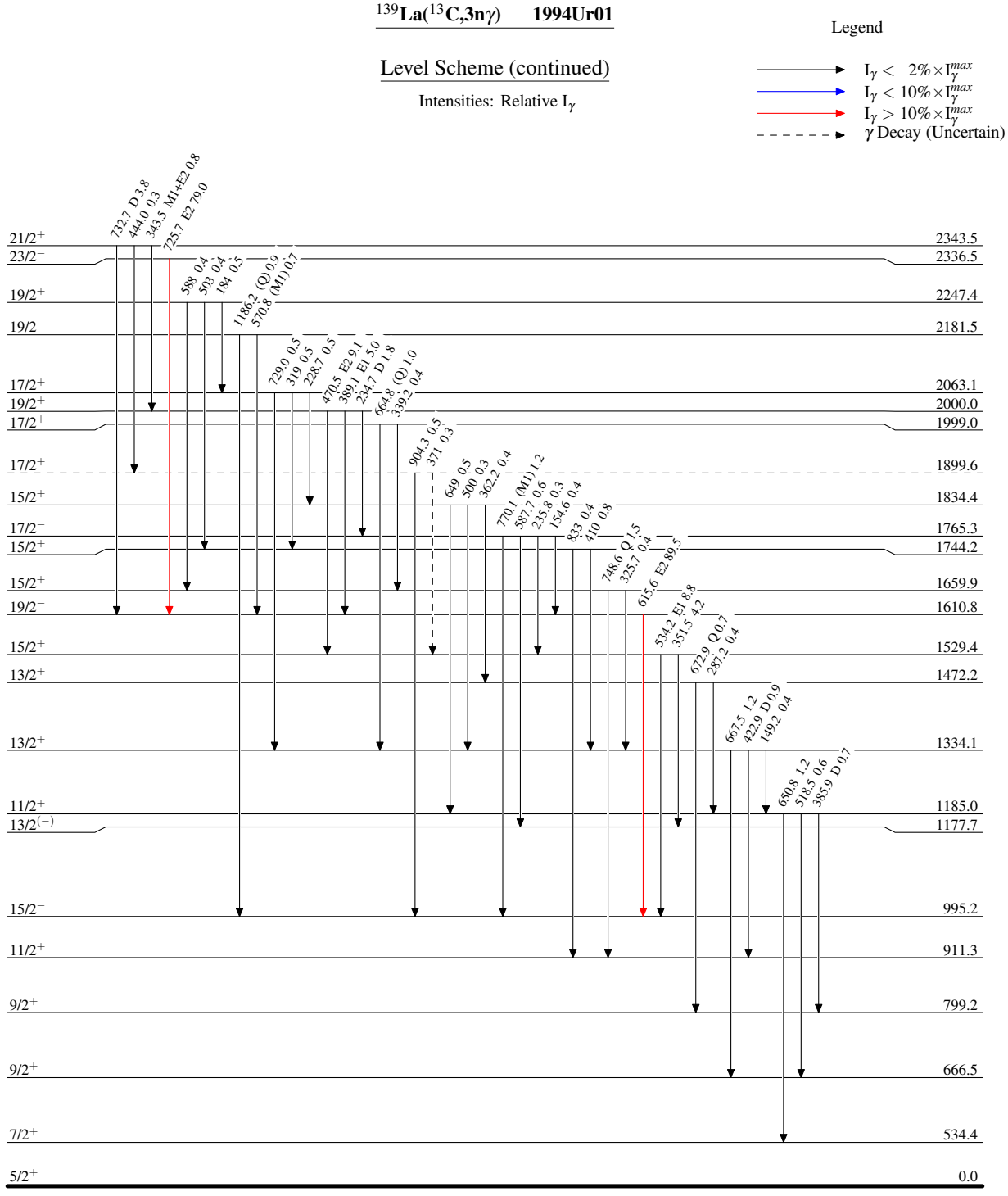


$^{149}_{63}Eu_{86}$

^{139}La(^{13}C,3nγ) 1994Ur01

Level Scheme (continued)

Intensities: Relative I_γ



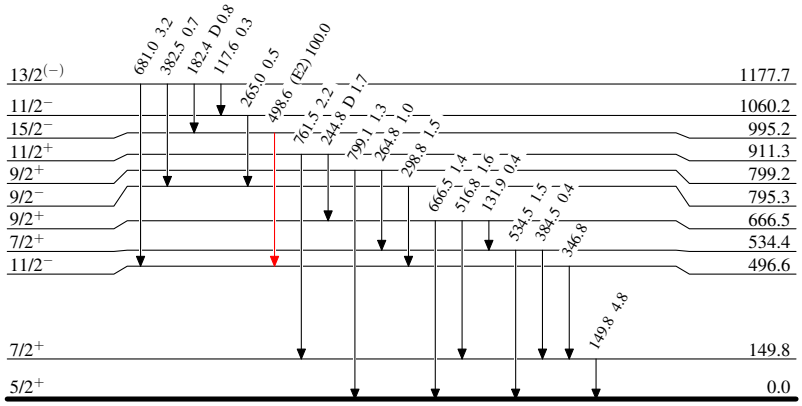
$^{149}_{63}Eu_{86}$

^{139}La(^{13}C,3nγ) 1994Ur01

Level Scheme (continued)

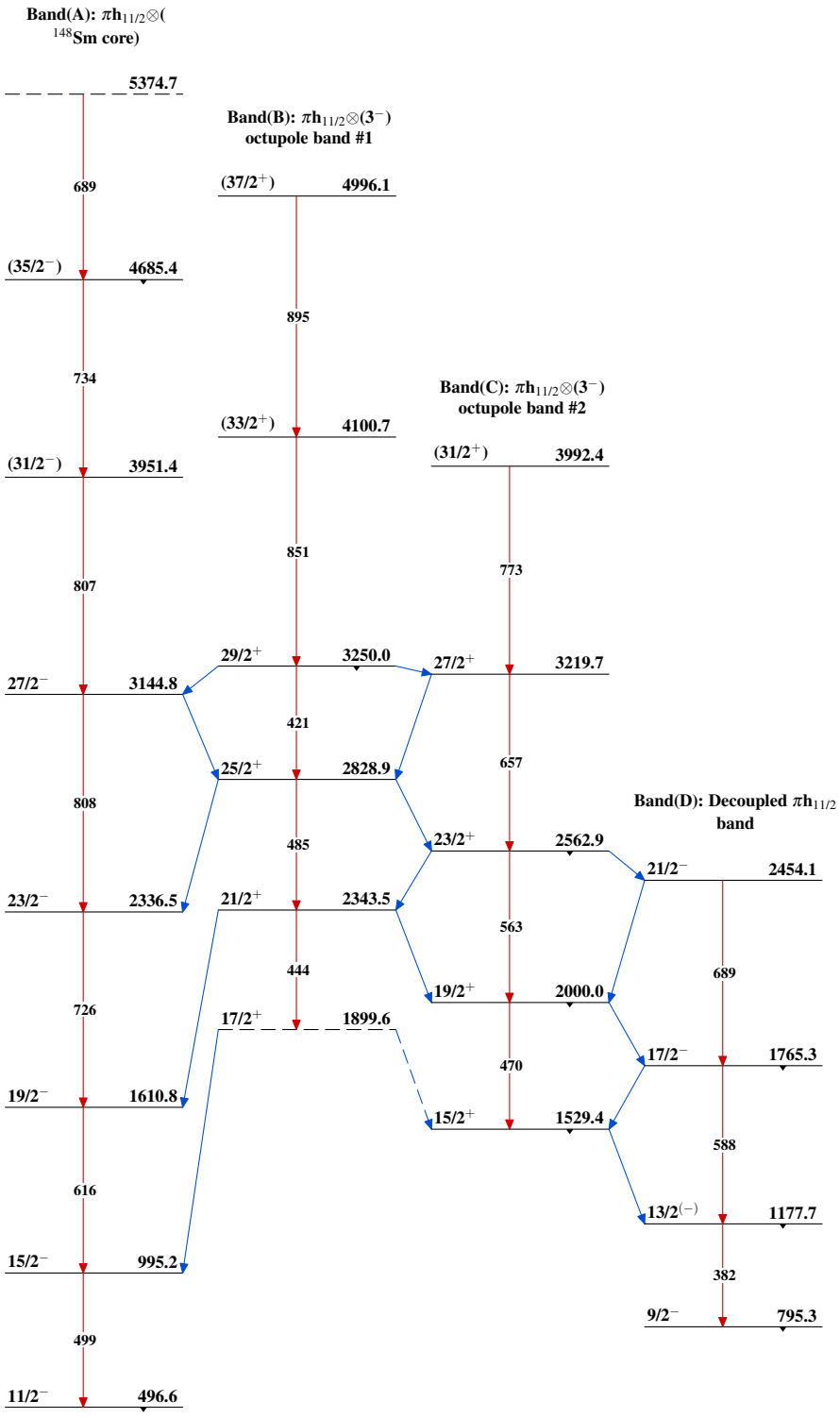
Intensities: Relative I_γ

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



$^{149}_{63}Eu_{86}$

^{139}La(^{13}C,3nγ) 1994Ur01



$^{149}_{63}Eu_{86}$