^{153}Eu(^{16}O,4nγ) 1984Jo05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 194,460 (2024)	31-Oct-2022

1984Jo05: E=73-85 MeV ^{16}O beams were produced from the Niels Bohr Institute FN tandem accelerator. Target was 5 mg/cm^2 metallic ^{153}Eu isotopically enriched to 98.76%. γ rays were detected with five Ge(Li) detectors with anti-Compton shields and a NaI(TI) crystal as a multiplicity filter. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$, γ(t). Deduced levels, J, π, band structures, γ-ray multipolarities and mixing ratios. Comparisons with theoretical calculations.

The level scheme is from 1984Jo05 with modifications introduced by 1995Sc39 based on results from measurements of ^{138}Ba(^{31}P,4nγ) and ^{150}Sm(^{19}F,4nγ). All bands are now interconnected whereas in 1984Jo05 bands π1/2[541], π1/2[411] and π5/2[402] formed one set and the bands π7/2[402] and π9/2[514] formed another set. The value of 0+y in 1984Jo05 is replaced here by 23.5+x, based on the Adopted Levels.

^{165}Lu Levels

E(level)[†]	J$^\pi$[‡]	Comments
0.0+x[@]	(3/2$^+$)	E(level): x≈20 keV; see the Adopted Levels for comments. Additional information 1.
5.5+x[a] 6	(5/2$^+$)	
23.5+x[&] 3	(7/2$^+$)	
54.79+x[‡] 21	(7/2$^-$)	Additional information 2.
141.7+x[a] 6	(7/2$^+$)	
147.4+x[@] 4	(5/2$^+$)	
182.6+x[&] 3	(9/2$^+$)	
195.30+x[@] 19	(7/2$^+$)	
234.84+x[c] 20	(9/2$^-$)	
305.9+x[a] 6	(9/2$^+$)	
335.2+x[c] 3	(11/2$^-$)	
345.3+x[b] 4	(5/2$^-$)	
366.8+x[&] 4	(11/2$^+$)	
432.3+x[@] 4	(9/2$^+$)	
466.4+x[b] 3	(9/2$^-$)	
494.5+x[c] 3	(13/2$^-$)	
499.2+x[a] 5	(11/2$^+$)	
519.6+x[@] 3	(11/2$^+$)	
574.6+x[&] 4	(13/2$^+$)	
662.4+x[c] 3	(15/2$^-$)	
694.6+x[b] 3	(13/2$^-$)	
712.0+x[a] 5	(13/2$^+$)	
802.7+x[&] 4	(15/2$^+$)	
821.4+x[@] 4	(13/2$^+$)	
893.2+x[c] 3	(17/2$^-$)	
943.6+x[@] 4	(15/2$^+$)	
956.5+x[a] 5	(15/2$^+$)	
1030.0+x[b] 4	(17/2$^-$)	
1049.8+x[&] 4	(17/2$^+$)	
1099.5+x[c] 3	(19/2$^-$)	
1198.4+x[a] 5	(17/2$^+$)	
1292.9+x[@] 4	(17/2$^+$)	
1311.6+x[&] 4	(19/2$^+$)	

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^{153}Eu(^{16}O,4nγ) 1984Jo05 (continued)

^{165}Lu Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
1386.7+x[c] 4	(21/2⁻)	1945.4+x[c] 4	(25/2⁻)	2535.8+x[c] 4	(29/2⁻)	3195.8+x[b] 8	(33/2⁻)
1445.9+x[&] 4	(19/2⁺)	1979.1+x[b] 5	(25/2⁻)	2539.3+x 5	(27/2⁺)	3249.6+x[c] 4	(35/2⁻)
1462.6+x[b] 5	(21/2⁻)	1990.9+x[@] 5	(23/2⁺)	2546.0+x[#] 7	(27/2⁺)	3330.7+x?[#&] 7	(33/2⁺)
1479.8+x[a] 6	(19/2⁺)	2050.0+x[a] 8	(23/2⁺)	2564.3+x[b] 6	(29/2⁻)	3476.7+x[c] 5	(37/2⁻)
1588.3+x[&] 4	(21/2⁺)	2168.2+x[&] 5	(25/2⁺)	2732.1+x[&] 5	(29/2⁺)	3736.5+x[c] 5	(39/2⁻)
1618.6+x[c] 4	(23/2⁻)	2196.6+x[c] 4	(27/2⁻)	2755.6+x?[a] 13	(29/2⁺)	3854.8+x[b] 9	(37/2⁻)
1740.9+x[a] 6	(21/2⁺)	2295.6+x?[a] 9	(25/2⁺)	2790.0+x[c] 4	(31/2⁻)	4011.7+x[c] 5	(41/2⁻)
1819.4+x[@] 5	(21/2⁺)	2350.2+x[@] 7	(25/2⁺)	3029.6+x?[#&] 7	(31/2⁺)	4324.0+x[c] 6	(43/2⁻)
1873.2+x[&] 4	(23/2⁺)	2460.6+x[&] 5	(27/2⁺)	3039.6+x[c] 4	(33/2⁻)	4483.9+x[#b] 11	(41/2⁻)

† From a least-squares fit to Eγ data. The energy of 54.75+x is held fixed in this procedure.
‡ From Adopted Levels.
# This level is probably non-existent in view of the work of 1995Sc39 and 2004Sc14, where it is absent, thus not listed in the Adopted Levels.
@ Band(A): π1/2[411] band.
& Band(B): π7/2[404] band.
a Band(C): π5/2[402] band.
b Band(D): π1/2[541] band.
c Band(E): π9/2[514] band.

γ(^{165}Lu)

Eγ†	Iγ†	Ei(level)	Jiπ	Ef	Jfπ	Mult.‡	δ‡	Comments
100.4 2	28 3	335.2+x	(11/2⁻)	234.84+x	(9/2⁻)	D+Q		A2=+0.04 3; A4=−0.04 3
121.1 5	5.3 18	466.4+x	(9/2⁻)	345.3+x	(5/2⁻)			
136.2 2	21.3 21	141.7+x	(7/2⁺)	5.5+x	(5/2⁺)	D+Q		A2=−0.04 3; A4=+0.04 3
147.4 5	12 4	147.4+x	(5/2⁺)	0.0+x	(3/2⁺)	D		A2=−0.21 7; A4=−0.05 7
152.6 6	6.0 20	335.2+x	(11/2⁻)	182.6+x	(9/2⁺)	D		A2=−0.21 7; A4=−0.05 7
159.1 2	56 5	182.6+x	(9/2⁺)	23.5+x	(7/2⁺)	D+Q		A2=+0.18 2; A4=−0.01 2 γ(θ) for 159.1γ+159.3γ.
159.3 2	77 7	494.5+x	(13/2⁻)	335.2+x	(11/2⁻)	D+Q		A2=+0.18 2; A4=−0.01 2 γ(θ) for 159.3γ+159.1γ.
164.2 2	16.0 16	305.9+x	(9/2⁺)	141.7+x	(7/2⁺)	D+Q		A2=−0.06 4; A4=−0.01 4
167.9 2	65 7	662.4+x	(15/2⁻)	494.5+x	(13/2⁻)	D+Q	+0.15 5	A2=−0.01 2; A4=−0.01 2
175.0 5	5.5 18	694.6+x	(13/2⁻)	519.6+x	(11/2⁺)	D		A2=−0.32 11; A4=+0.06 12
180.1 2	100	234.84+x	(9/2⁻)	54.79+x	(7/2⁻)	D		A2=+0.16 2; A4=−0.02 2
184.2 2	37 3	366.8+x	(11/2⁺)	182.6+x	(9/2⁺)	D+Q	+0.47 7	A2=+0.32 3; A4=−0.01 3
193.3 5	8.6 25	499.2+x	(11/2⁺)	305.9+x	(9/2⁺)			
195.3 2	93 9	195.30+x	(7/2⁺)	0.0+x	(3/2⁺)	Q		A2=+0.29 2; A4=−0.07 2
206.3 2	53 5	1099.5+x	(19/2⁻)	893.2+x	(17/2⁻)	D+Q	+0.15 3	A2=+0.01 2; A4=−0.01 2
207.8 2	15.3 15	574.6+x	(13/2⁺)	366.8+x	(11/2⁺)	D+Q	+0.57 10	A2=+0.38 6; A4=−0.01 5
210.0 2	22.2 22	3249.6+x	(35/2⁻)	3039.6+x	(33/2⁻)	D+Q	+0.05 3	A2=−0.13 3; A4=0.00 3
211.3 2	99	234.84+x	(9/2⁻)	23.5+x	(7/2⁺)	D		A2=−0.27 2; A4=0.00 2
212.8 5	6.0 20	712.0+x	(13/2⁺)	499.2+x	(11/2⁺)	D+Q	+0.25 6	A2=+0.12 15; A4=+0.04 15
227.1 5		3476.7+x	(37/2⁻)	3249.6+x	(35/2⁻)			
228.1 5	13 4	802.7+x	(15/2⁺)	574.6+x	(13/2⁺)			A2=+0.18 2; A4=−0.07 2 γ(θ) for 228.1γ+228.2γ.
228.2 2	58 6	694.6+x	(13/2⁻)	466.4+x	(9/2⁻)	Q		A2=+0.18 2; A4=−0.07 2 γ(θ) for 228.2γ+228.1γ.
230.8 2	56 5	893.2+x	(17/2⁻)	662.4+x	(15/2⁻)	D+Q	+0.22 4	A2=+0.10 2; A4=−0.01 2

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^{153}Eu(^{16}O,4nγ) 1984Jo05 (continued)

$\gamma(^{165}Lu)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
231.9 *2*	26 *3*	1618.6+x	(23/2$^-$)	1386.7+x	(21/2$^-$)	D+Q	+0.11 *3*	A_2=−0.04 *3*; A_4=+0.02 *3*
237.0 *5*	9 *3*	432.3+x	(9/2$^+$)	195.30+x	(7/2$^+$)	D		A_2=−0.41 *11*; A_4=0.00 *12*
241.9 *5*		1198.4+x	(17/2$^+$)	956.5+x	(15/2$^+$)			
244.5 *5*		956.5+x	(15/2$^+$)	712.0+x	(13/2$^+$)			
247.1 *5*	9 *3*	1049.8+x	(17/2$^+$)	802.7+x	(15/2$^+$)	D+Q	+0.38 *13*	A_2=+0.29 *11*; A_4=−0.08 *11*
249.6 *2*	15.9	3039.6+x	(33/2$^-$)	2790.0+x	(31/2$^-$)	D(+Q)	+0.04 *4*	A_2=−0.14 *7*; A_4=−0.01 *7*
251.2 *3*	11.8 *25*	2196.6+x	(27/2$^-$)	1945.4+x	(25/2$^-$)	D(+Q)	+0.07 *7*	A_2=−0.11 *9*; A_4=+0.05 *10*
254.2 *5*	12 *2*	2790.0+x	(31/2$^-$)	2535.8+x	(29/2$^-$)	D		A_2=−0.25 *9*; A_4=+0.07 *9*
259.7 *2*	<31	494.5+x	(13/2$^-$)	234.84+x	(9/2$^-$)	Q		A_2=+0.20 *5*; A_4=−0.09 *5* I_γ: I(259.7γ+259.8γ)=309 *30*. $\gamma(\theta)$ for 259.8γ+259.7γ.
259.8 *2*	<31	3736.5+x	(39/2$^-$)	3476.7+x	(37/2$^-$)			A_2=+0.20 *5*; A_4=−0.09 *5* I_γ: 309 *31* for 259.8+259.7. $\gamma(\theta)$ for 259.8γ+259.7γ.
261.1 *5*		1740.9+x	(21/2$^+$)	1479.8+x	(19/2$^+$)			
261.8 *5*	10 *3*	1311.6+x	(19/2$^+$)	1049.8+x	(17/2$^+$)			
271.1 *2*	56 *6*	466.4+x	(9/2$^-$)	195.30+x	(7/2$^+$)	D		A_2=−0.19 *3*; A_4=0.00 *3*
271.5[#]		2732.1+x	(29/2$^+$)	2460.6+x	(27/2$^+$)	D		A_2=−0.19 *3*; A_4=0.00 *3* $\gamma(\theta)$ for 271.5γ+271.1γ.
275.2 *3*	14 *4*	4011.7+x	(41/2$^-$)	3736.5+x	(39/2$^-$)	D(+Q)	+0.04 *4*	A_2=−0.12 *8*; A_4=+0.01 *8*
276.7 *3*	12 *2*	1588.3+x	(21/2$^+$)	1311.6+x	(19/2$^+$)	D+Q	+0.26 *7*	A_2=+0.15 *9*; A_4=−0.07 *9*
281.4 *5*		1479.8+x	(19/2$^+$)	1198.4+x	(17/2$^+$)			
284.9 *5*	12 *4*	432.3+x	(9/2$^+$)	147.4+x	(5/2$^+$)			A_2=+0.17 *7*; A_4=+0.01 *8* $\gamma(\theta)$ for 284.9γ+284.9γ.
284.9 *5*	6.6 *20*	1873.2+x	(23/2$^+$)	1588.3+x	(21/2$^+$)			A_2=+0.17 *7*; A_4=+0.01 *8* $\gamma(\theta)$ for 284.9γ+284.9γ.
287.2 *2*	44 *4*	1386.7+x	(21/2$^-$)	1099.5+x	(19/2$^-$)	D+Q	+0.21 *4*	A_2=+0.07 *4*; A_4=−0.02 *4*
292.4 *5*	5.6 *18*	2460.6+x	(27/2$^+$)	2168.2+x	(25/2$^+$)	D+Q	+0.44 *12*	A_2=+0.34 *10*; A_4=−0.12 *10*
295.0 *5*	6.5 *20*	2168.2+x	(25/2$^+$)	1873.2+x	(23/2$^+$)	D+Q	+0.40 *12*	A_2=+0.34 *9*; A_4=−0.04 *8*
300.4 *5*	6.4 *20*	305.9+x	(9/2$^+$)	5.5+x	(5/2$^+$)	Q		A_2=+0.38 *9*; A_4=−0.14 *8*
301.8 *5*	4.1 *14*	821.4+x	(13/2$^+$)	519.6+x	(11/2$^+$)	D(+Q)	+0.07 *7*	A_2=−0.08 *14*; A_4=−0.12 *16*
312.3 *5*	8.1 *25*	4324.0+x	(43/2$^-$)	4011.7+x	(41/2$^-$)	D+Q	+0.18 *7*	A_2=+0.06 *9*; A_4=+0.07 *9*
324.3 *2*	33 *3*	519.6+x	(11/2$^+$)	195.30+x	(7/2$^+$)	Q		A_2=+0.27 *6*; A_4=−0.10 *6*
326.8 *2*	29 *3*	1945.4+x	(25/2$^-$)	1618.6+x	(23/2$^-$)			A_2=+0.20 *3*; A_4=−0.03 *3* $\gamma(\theta)$ for 326.8γ+327.2γ.
327.2 *2*	37 *4*	662.4+x	(15/2$^-$)	335.2+x	(11/2$^-$)	Q		A_2=+0.20 *3*; A_4=−0.03 *3* $\gamma(\theta)$ for 327.2γ+326.8γ.
335.4 *2*	45 *5*	1030.0+x	(17/2$^-$)	694.6+x	(13/2$^-$)	Q		A_2=+0.24 *3*; A_4=−0.08 *3*
339.2 *2*	19.6 *20*	2535.8+x	(29/2$^-$)	2196.6+x	(27/2$^-$)	D+Q	+0.16 *4*	A_2=+0.01 *4*; A_4=+0.03 *4*
343.3 *2*	34 *3*	366.8+x	(11/2$^+$)	23.5+x	(7/2$^+$)	Q		A_2=+0.26 *4*; A_4=−0.07 *4*
345.3[#] *5*		345.3+x	(5/2$^-$)	0.0+x	(3/2$^+$)			
349.3 *5*	5.3 *18*	1292.9+x	(17/2$^+$)	943.6+x	(15/2$^+$)	D(+Q)	+0.06 *6*	A_2=−0.01 *11*; A_4=+0.10 *12*
357.5 *5*	4.9 *16*	499.2+x	(11/2$^+$)	141.7+x	(7/2$^+$)			
389.1 *3*	12 *4*	821.4+x	(13/2$^+$)	432.3+x	(9/2$^+$)	Q		A_2=+0.27 *8*; A_4=−0.10 *8*
392.0 *2*	50 *5*	574.6+x	(13/2$^+$)	182.6+x	(9/2$^+$)	Q		A_2=+0.25 *3*; A_4=−0.09 *3*
398.7 *2*	51 *5*	893.2+x	(17/2$^-$)	494.5+x	(13/2$^-$)	Q		A_2=+0.31 *3*; A_4=−0.11 *3*
406.1 *5*	10 *4*	712.0+x	(13/2$^+$)	305.9+x	(9/2$^+$)	Q		A_2=+0.30 *5*; A_4=−0.13 *5*
424.0 *2*	23.9 *24*	943.6+x	(15/2$^+$)	519.6+x	(11/2$^+$)	Q		A_2=+0.28 *3*; A_4=−0.15 *3*
432.6 *2*	30 *3*	1462.6+x	(21/2$^-$)	1030.0+x	(17/2$^-$)	Q		A_2=+0.29 *7*; A_4=−0.08 *7*
435.9 *2*	36 *4*	802.7+x	(15/2$^+$)	366.8+x	(11/2$^+$)	Q		A_2=+0.19 *2*; A_4=−0.03 *2* $\gamma(\theta)$ for 435.9γ+436.9γ+437.1γ+437.1 γ.
436.9 *5*	7.2 *24*	956.5+x	(15/2$^+$)	519.6+x	(11/2$^+$)	Q		A_2=+0.19 *2*; A_4=−0.03 *2* $\gamma(\theta)$ for 436.9γ+435.9γ+437.1γ.
437.1 *2*	74 *7*	1099.5+x	(19/2$^-$)	662.4+x	(15/2$^-$)	Q		A_2=+0.19 *2*; A_4=−0.03 *2* $\gamma(\theta)$ for 437.1γ+436.9γ+435.9γ.

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^{153}Eu(^{16}O,4nγ) 1984Jo05 (continued)

γ(^{165}Lu) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
437.1 *2*	16.7 *17*	3476.7+x	(37/2$^-$)	3039.6+x	(33/2$^-$)	(Q)	A_2=+0.19 *2*; A_4=−0.03 *2* $\gamma(\theta)$ for 437.1γ+436.9γ+435.9γ.
444.4 *5*	11 *4*	943.6+x	(15/2$^+$)	499.2+x	(11/2$^+$)	Q	A_2=+0.41 *6*; A_4=−0.15 *6*
457.3 *5*	5.9 *20*	956.5+x	(15/2$^+$)	499.2+x	(11/2$^+$)	Q	A_2=+0.54 *15*; A_4=+0.15 *14*
459.6 *2*	20.6 *21*	3249.6+x	(35/2$^-$)	2790.0+x	(31/2$^-$)	Q	A_2=+0.26 *4*; A_4=−0.05 *4*
460[#&]		2755.6+x?	(29/2$^+$)	2295.6+x?	(25/2$^+$)		
471.5 *2*	16.3 *16*	1292.9+x	(17/2$^+$)	821.4+x	(13/2$^+$)	(Q)	A_2=+0.33 *11*; A_4=+0.01 *11*
475.2 *2*	49 *5*	1049.8+x	(17/2$^+$)	574.6+x	(13/2$^+$)	Q	A_2=+0.28 *2*; A_4=−0.08 *2*
476[#&]		2295.6+x?	(25/2$^+$)	1819.4+x	(21/2$^+$)		
486.4 *2*	16.5 *17*	1198.4+x	(17/2$^+$)	712.0+x	(13/2$^+$)	Q	A_2=+0.22 *3*; A_4=−0.07 *3* $\gamma(\theta)$ for 486.4γ+486.9γ.
486.9 *3*	14.4 *20*	3736.5+x	(39/2$^-$)	3249.6+x	(35/2$^-$)	(Q)	A_2=+0.22 *3*; A_4=−0.07 *3* $\gamma(\theta)$ for 486.9γ+486.4γ.
493.5 *2*	56 *6*	1386.7+x	(21/2$^-$)	893.2+x	(17/2$^-$)	Q	A_2=+0.24 *2*; A_4=−0.08 *2*
502.3 *2*	36 *4*	1445.9+x	(19/2$^+$)	943.6+x	(15/2$^+$)	Q	A_2=+0.24 *4*; A_4=−0.08 *4*
503.8 *2*	18.6 *19*	3039.6+x	(33/2$^-$)	2535.8+x	(29/2$^-$)	(Q)	A_2=+0.23 *6*; A_4=−0.05 *6*
508.9 *2*	37 *4*	1311.6+x	(19/2$^+$)	802.7+x	(15/2$^+$)		
516.5 *2*	23.5 *24*	1979.1+x	(25/2$^-$)	1462.6+x	(21/2$^-$)	Q	A_2=+0.18 *6*; A_4=−0.13 *6*
519.1 *2*	80 *8*	1618.6+x	(23/2$^-$)	1099.5+x	(19/2$^-$)	Q	A_2=+0.21 *2*; A_4=−0.09 *2*
523.3 *5*		1479.8+x	(19/2$^+$)	956.5+x	(15/2$^+$)		
526.5 *3*	14.1 *20*	1819.4+x	(21/2$^+$)	1292.9+x	(17/2$^+$)	Q	A_2=+0.24 *8*; A_4=−0.10 *8*
530.8 *5*	7.6 *25*	2350.2+x	(25/2$^+$)	1819.4+x	(21/2$^+$)	Q	A_2=+0.19 *13*; A_4=−0.14 *13*
535.0 *5*		4011.7+x	(41/2$^-$)	3476.7+x	(37/2$^-$)		
538.5 *2*	48 *5*	1588.3+x	(21/2$^+$)	1049.8+x	(17/2$^+$)	Q	A_2=+0.30 *3*; A_4=−0.09 *3*
542.5 *2*	15.5 *16*	1740.9+x	(21/2$^+$)	1198.4+x	(17/2$^+$)	Q	A_2=+0.28 *6*; A_4=−0.12 *6*
545.0 *2*	34 *3*	1990.9+x	(23/2$^+$)	1445.9+x	(19/2$^+$)	Q	A_2=+0.27 *3*; A_4=−0.10 *3*
548.4 *2*	16.5 *17*	2539.3+x	(27/2$^+$)	1990.9+x	(23/2$^+$)	Q	A_2=+0.22 *7*; A_4=−0.11 *7*
555[#&]		2295.6+x?	(25/2$^+$)	1740.9+x	(21/2$^+$)		
555.1[@&] *5*	10 *3*	2546.0+x	(27/2$^+$)	1990.9+x	(23/2$^+$)	(Q)	A_2=+0.18 *7*; A_4=−0.08 *8*
558.7 *2*	39 *4*	1945.4+x	(25/2$^-$)	1386.7+x	(21/2$^-$)	Q	A_2=+0.27 *4*; A_4=−0.09 *4*
561.6 *2*	43 *4*	1873.2+x	(23/2$^+$)	1311.6+x	(19/2$^+$)	Q	A_2=+0.31 *3*; A_4=−0.12 *3*
563.9 *2*	37 *4*	2732.1+x	(29/2$^+$)	2168.2+x	(25/2$^+$)	Q	A_2=+0.41 *4*; A_4=−0.12 *4*
569.0[@&] *5*		3029.6+x?	(31/2$^+$)	2460.6+x	(27/2$^+$)		
570.2 *5*		2050.0+x	(23/2$^+$)	1479.8+x	(19/2$^+$)		
578.0 *2*	64 *6*	2196.6+x	(27/2$^-$)	1618.6+x	(23/2$^-$)	Q	A_2=+0.24 *3*; A_4=−0.11 *3*
579.9 *2*	37 *4*	2168.2+x	(25/2$^+$)	1588.3+x	(21/2$^+$)	Q	A_2=+0.28 *4*; A_4=−0.10 *4*
585.2 *3*	14.0 *20*	2564.3+x	(29/2$^-$)	1979.1+x	(25/2$^-$)		
587.4 *2*	24.7 *25*	2460.6+x	(27/2$^+$)	1873.2+x	(23/2$^+$)	Q	A_2=+0.24 *5*; A_4=−0.07 *5*
587.5 *5*	12 *2*	4324.0+x	(43/2$^-$)	3736.5+x	(39/2$^-$)	Q	A_2=+0.24 *5*; A_4=−0.07 *5*
590.4 *2*	31 *3*	2535.8+x	(29/2$^-$)	1945.4+x	(25/2$^-$)	Q	A_2=+0.34 *5*; A_4=−0.13 *5*
593.4 *2*	31 *3*	2790.0+x	(31/2$^-$)	2196.6+x	(27/2$^-$)	Q	A_2=+0.24 *6*; A_4=−0.12 *6*
598.6[@&] *5*		3330.7+x?	(33/2$^+$)	2732.1+x	(29/2$^+$)		
629.1 *5*	4.1 *14*	4483.9+x	(41/2$^-$)	3854.8+x	(37/2$^-$)		E_γ: this γ could correspond to 628.8γ from 3823.8+x, 37/2$^-$ level or 629.6γ from 4453.4+x, 41/2$^-$ level in (^{30}Si,4nγ), from which the level scheme is adopted in Adopted Levels, Gammas.
631.5 *5*	7.4 *25*	3195.8+x	(33/2$^-$)	2564.3+x	(29/2$^-$)		
659.0 *5*	6.2 *20*	3854.8+x	(37/2$^-$)	3195.8+x	(33/2$^-$)		

[†] From 1984Jo05, with intensities measured at E(^{16}O)=84 MeV.
[‡] From $\gamma(\theta)$ data in 1984Jo05. A_2 and A_4 of $\gamma(\theta)$ data are given under comments.
[#] Weak gamma ray.

Continued on next page (footnotes at end of table)

^{153}Eu(^{16}O,4nγ) 1984Jo05 (continued)

γ(^{165}Lu) (continued)

@ This gamma ray is absent in the work of 1995Sc39 and 2004Sc14.
& Placement of transition in the level scheme is uncertain.

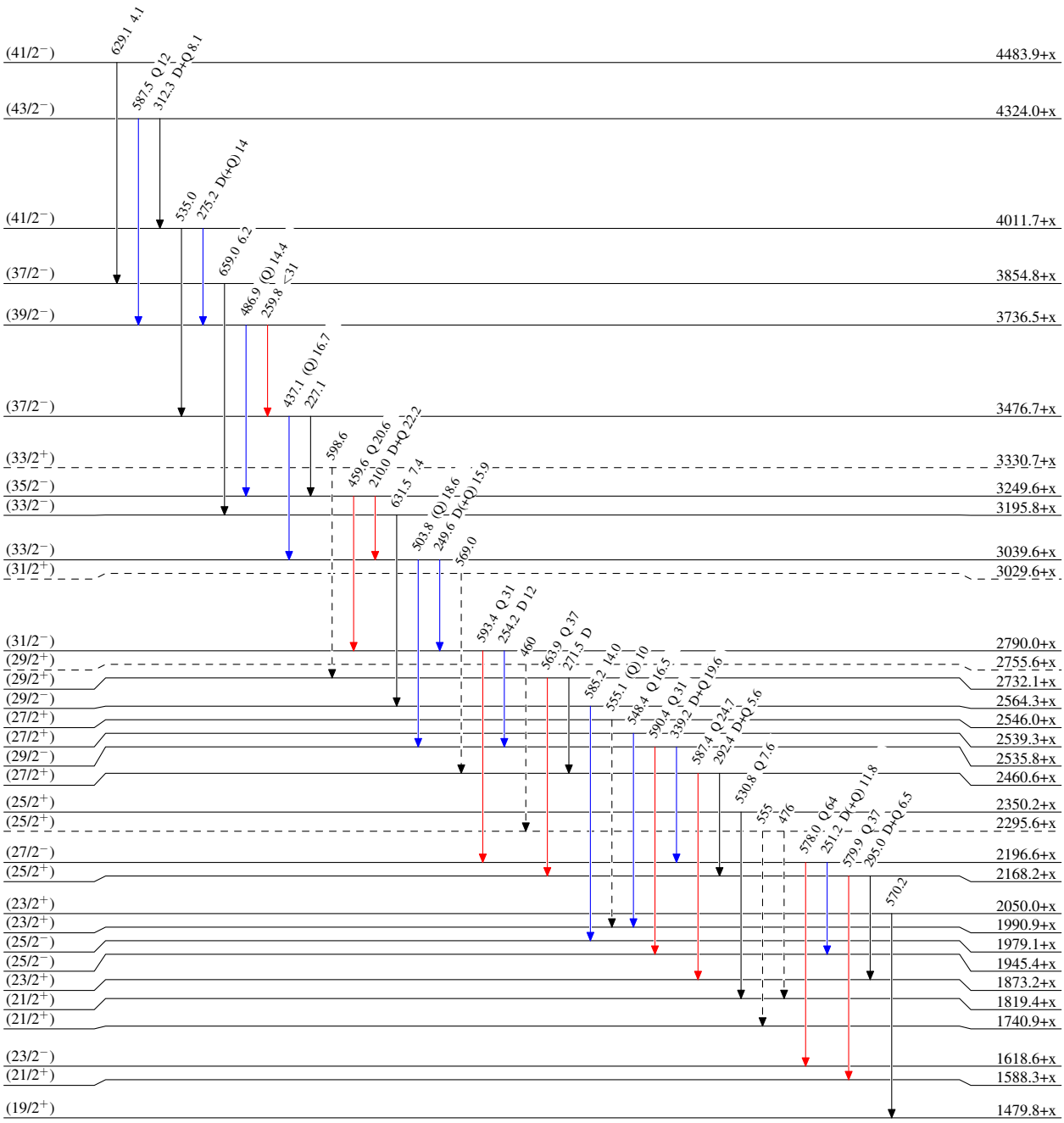
^{153}Eu(^{16}O,4nγ) 1984Jo05

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)

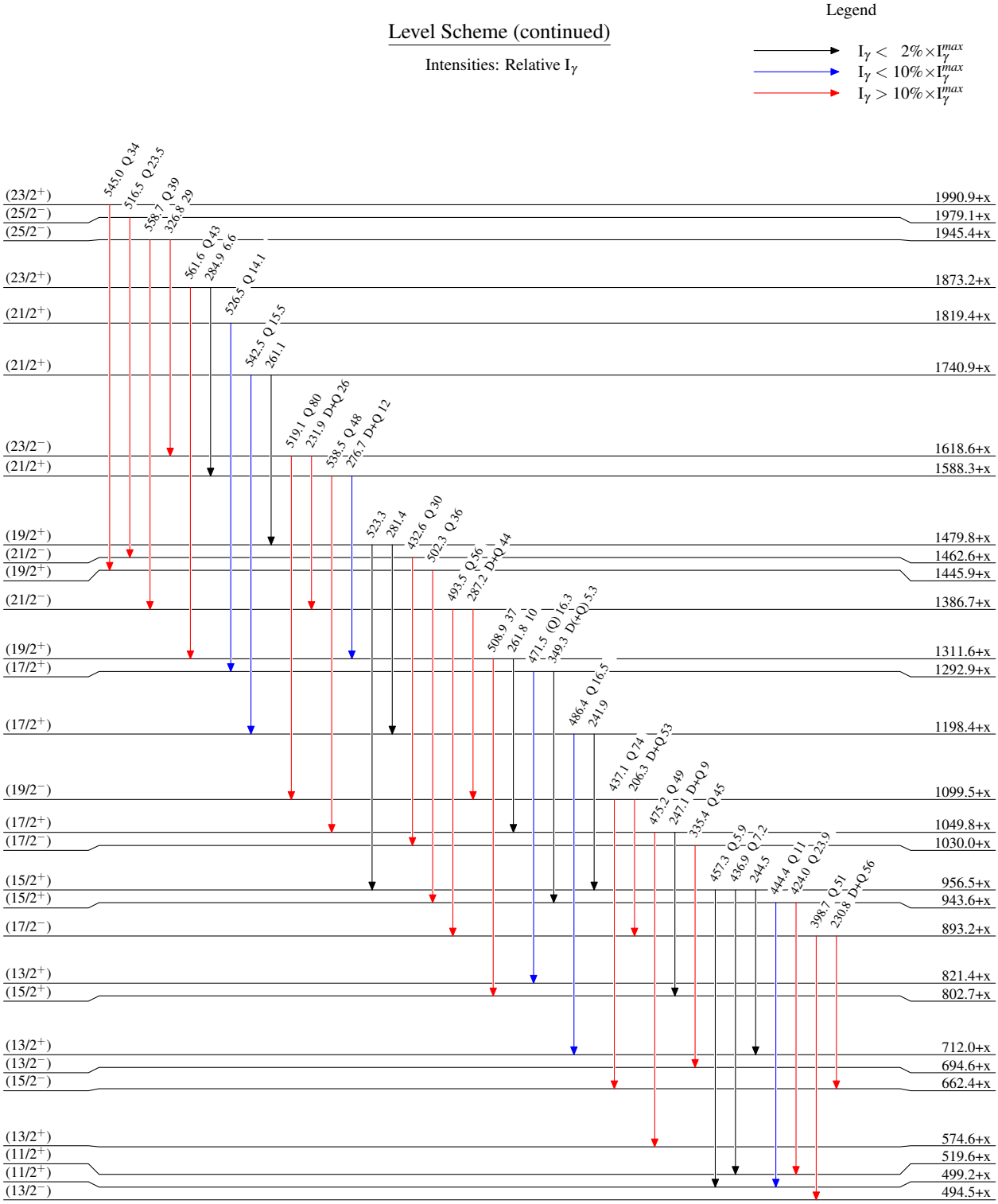


$^{165}_{71}Lu_{94}$

^{153}Eu(^{16}O,4nγ) 1984Jo05

Level Scheme (continued)

Intensities: Relative I_γ

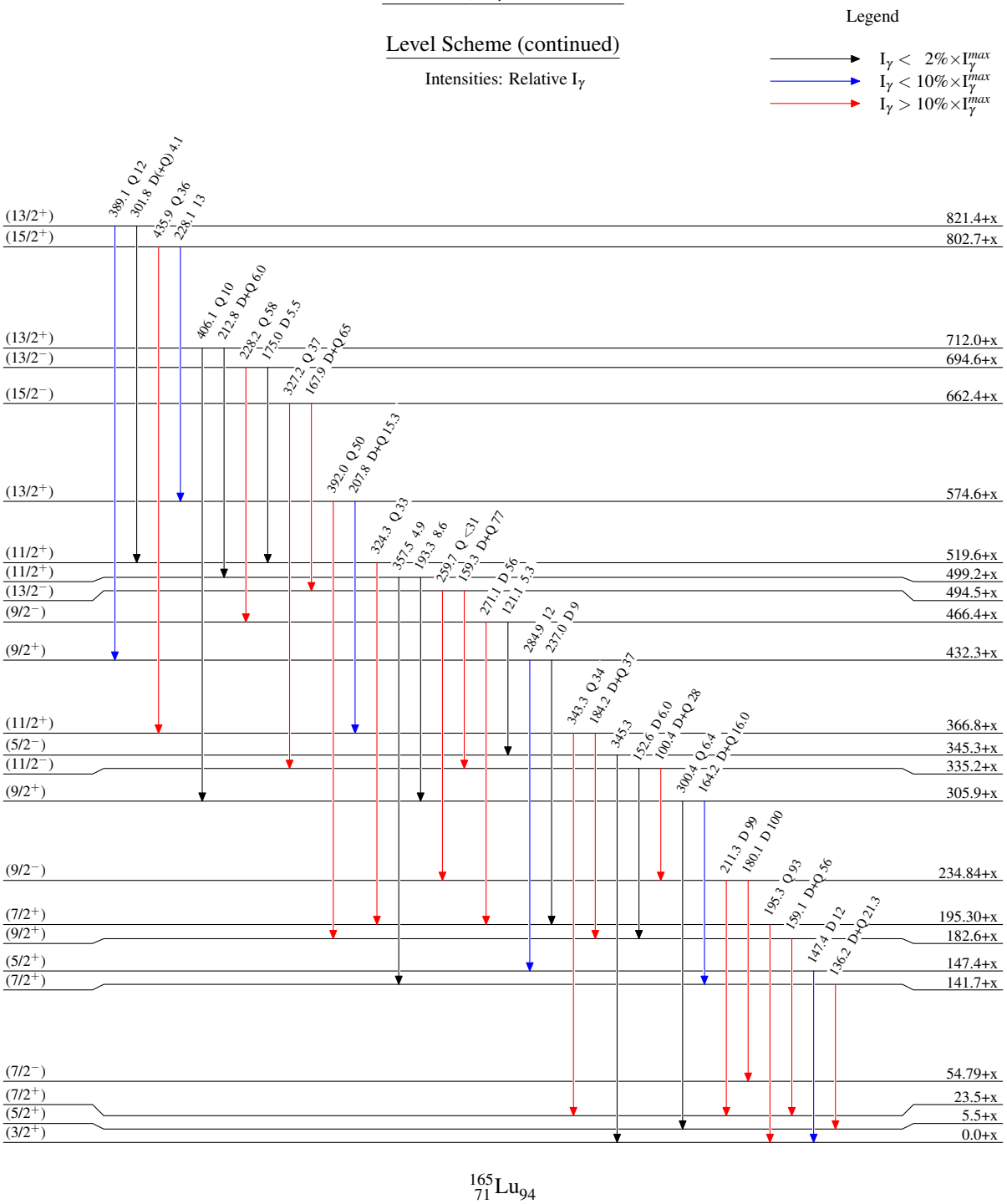


$^{165}_{71}Lu_{94}$

^{153}Eu(^{16}O,4nγ) 1984Jo05

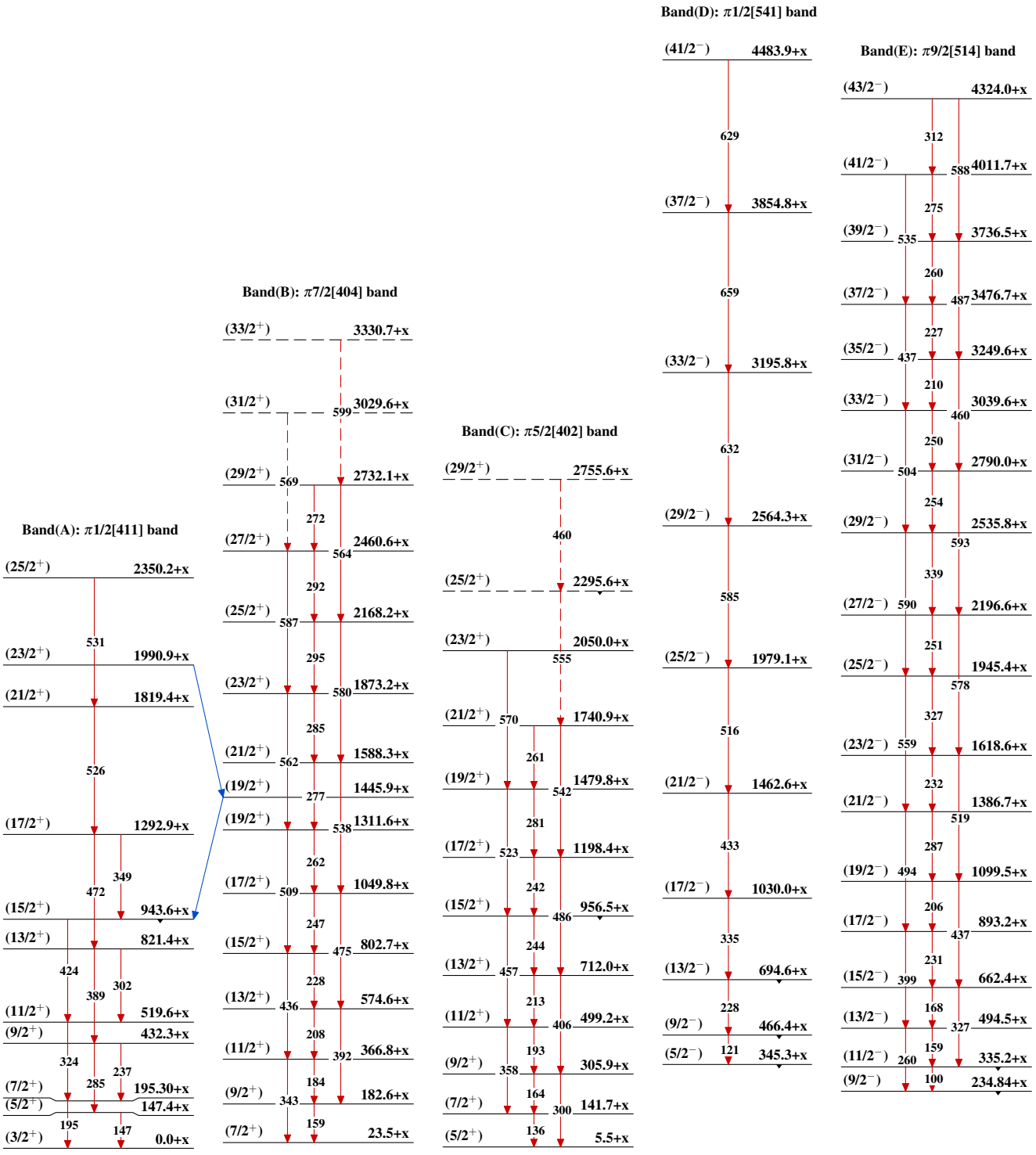
Level Scheme (continued)

Intensities: Relative I_γ



$^{165}_{71}Lu_{94}$

^{153}Eu(^{16}O,4nγ) 1984Jo05



$^{165}_{71}Lu_{94}$