^{159}Tb(^{12}C,5nγ) 1992Ho02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 109, 1103 (2008)	1-Mar-2008

E=75-90 MeV; two Ge detectors with BGO Compton suppression and a high-resolution planar detector; measured Eγ, Iγ and $\gamma\gamma$ coin; statistical precision was inadequate to enable extraction of $\gamma(\theta)$ information.

^{166}Lu Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	6$^-$		J$^\pi$: from Adopted Levels.
83.50 *10*	(6$^+$)	92 ns *7*	$T_{1/2}$: from centroid shift between 83.5γ and the prompt 85.5γ. Other: 91 ns *8* from slope of 83.5γ time spectrum.
144.79 *14*	(6$^-$,7$^-$)		
189.8[#] *10*	(6$^+$)		
287.21[&] *14*	(7$^-$)		
290.5[@] *11*	(7$^+$)		
303.29? *24*			
341.10[a] *16*	(8$^-$)		
425.5[#] *11*	(8$^+$)		
426.59[&] *24*	(9$^-$)		
539.12[a] *24*	(10$^-$)		
591.2[@] *11*	(9$^+$)		
694.6[&] *3*	(11$^-$)		
786.9[#] *11*	(10$^+$)		
867.9[a] *3*	(12$^-$)		
1004.6[@] *11*	(11$^+$)		
1083.5[&] *3*	(13$^-$)		
1250.5[#] *11*	(12$^+$)		
1313.0[a] *3*	(14$^-$)		
1512.0[@] *11*	(13$^+$)		
1574.8[&] *3*	(15$^-$)		
1799.6[#] *11*	(14$^+$)		
1856.9[a] *4*	(16$^-$)		
2096.3[@] *11*	(15$^+$)		
2152.2[&] *4*	(17$^-$)		
2416.9[#] *11*	(16$^+$)		
2482.6[a] *4*	(18$^-$)		
2739.1[@] *12*	(17$^+$)		
2800.0[&] *4*	(19$^-$)		
3069.8[#] *12*	(18$^+$)		
3203.6[a] *11*	(20$^-$)		E(level): not adopted; γ deexciting the J=20 member of this band was missed by 1992Ho02 and the 721γ placed from this level probably deexcites a higher-energy band member.
3430.1[@] *16*	(19$^+$)		
3499.5[&] *5*	(21$^-$)		
0.0+x[c]	(7$^-$)		E(level): x=196 from Adopted Levels, where this level is seen to decay to 83.5 level via a 112.5γ.
139.90+x[c] *20*	(9$^-$)		
162.4+x[b] *3*	(8$^-$)		
391.7+x[b] *4*	(10$^-$)		

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^{159}Tb(^{12}C,5nγ) 1992Ho02 (continued)

^{166}Lu Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
395.7+x[c] 3	(11⁻)	1128.2+x[b] 5	(14⁻)	1795.2+x[c] 6	(17⁻)	2902.9+x[b] 7	(20⁻)
711.3+x[b] 3	(12⁻)	1237.3+x[c] 5	(15⁻)	2235.0+x[b] 6	(18⁻)	3623.7+x[b] 7	(22⁻)
765.5+x[c] 4	(13⁻)	1638.7+x[b] 5	(16⁻)	2419.6+x[c] 7	(19⁻)		

† From least-squares fit to Eγ.
‡ Authors′ values.
# Band(A): $K^\pi=6^+$, α=0 (π 7/2[404])+(ν 5/2[642]) band.
@ Band(a): $K^\pi=6^+$, α=1 (π 7/2[404])+(ν 5/2[642]) band.
& Band(b): $K^\pi=7^-$, α=1 (π 9/2[514])+(ν 5/2[642]) band. Note that Jπ values assigned by 1992Ho02 for this configuration are one unit lower than those In Adopted Levels.
[a] Band(B): $K^\pi=7^-$, α=0 (π 9/2[514])+(ν 5/2[642]) band. See comment on signature partner band.
[b] Band(C): π=−, α=0 (π 1/2[541])(ν 5/2[642]) band.
[c] Band(c): π=−, α=1 (π 1/2[541])(ν 5/2[642]) band. Note that this band assignment differs from that In Adopted Levels.

γ(^{166}Lu)

Eγ†	Iγ‡	Ei(level)	Jiπ	Ef	Jfπ	Mult.#	α&	Comments
45		189.8	(6⁺)	144.79	(6⁻,7⁻)	E1	0.566	
54.0 3		341.10	(8⁻)	287.21	(7⁻)	[M1(+E2)]	24 21	γ not observed but its existence is implied by γγ coin data and presence of 139γ crossover transition; possibly highly converted.
61.3 1	47.9	144.79	(6⁻,7⁻)	83.50	(6⁺)	E1	0.240	
83.5 1	64.0	83.50	(6⁺)	0.0	6⁻	E1	0.560	
85.5 2	8.1	426.59	(9⁻)	341.10	(8⁻)	[M1(+E2)]	6.0 3	
100.8 2	8.9	290.5	(7⁺)	189.8	(6⁺)	[M1+E2]	3.43 18	
112.5 1	13.1	539.12	(10⁻)	426.59	(9⁻)	[M1(+E2)]	2.38 25	
x115@	4.6							
135.0 2	8.6	425.5	(8⁺)	290.5	(7⁺)	[M1(+E2)]	1.33 24	
139[a]	8.7	426.59	(9⁻)	287.21	(7⁻)	[E2]	0.982	Iγ: 8.7 for 139γ+139.9γ.
139.9 2	8.7	139.90+x	(9⁻)	0.0+x	(7⁻)	[E2]	0.950	Iγ: 8.7 for 139γ+139.9γ.
142.5 2	7.4	287.21	(7⁻)	144.79	(6⁻,7⁻)	M1(+E2)	1.12 23	
155.5 1	16.9	694.6	(11⁻)	539.12	(10⁻)	[M1(+E2)]	0.85 20	
158.5[a] 2	7.3	303.29?		144.79	(6⁻,7⁻)	(E1)	0.1046	
x160.7@ 3	5.0							
162.4[a] 3	2.7	162.4+x	(8⁻)	0.0+x	(7⁻)	[M1(+E2)]	0.74 19	
165.6 2	6.6	591.2	(9⁺)	425.5	(8⁺)	[M1(+E2)]	0.70 18	
x172@	3.7							
173.3 1	13.9	867.9	(12⁻)	694.6	(11⁻)	[M1(+E2)]	0.61 10	
x181.3@ 3	4.5							
195.7 2	6.6	786.9	(10⁺)	591.2	(9⁺)	[M1(+E2)]	0.42 13	
196.3 1	10.0	341.10	(8⁻)	144.79	(6⁻,7⁻)	M1,E2	0.42 13	
198.0 3	<3.9	539.12	(10⁻)	341.10	(8⁻)	[E2]	0.287	Iγ: 3.9 for multiplet.
203.7 1	<11.7	287.21	(7⁻)	83.50	(6⁺)	(E1)		Iγ,Mult.: Iγ=11.7 for multiplet; second component not identified by 1992Ho02. Authors assign mult=E1 based on intensity balance, but this May not Be

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^{159}Tb(^{12}C,5nγ) 1992Ho02 (continued)

γ(^{166}Lu) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	α [&]	Comments
								reliable because the 204γ is a multiplet. Additional information 1.
215.6 *1*	10.5	1083.5	(13$^-$)	867.9	(12$^-$)	[M1(+E2)]	0.32 *11*	
217.7 *2*	5.5	1004.6	(11$^+$)	786.9	(10$^+$)	[M1(+E2)]	0.31 *10*	
229.3 *2*	5.6	391.7+x	(10$^-$)	162.4+x	(8$^-$)			
229.5 *2*	7.9	1313.0	(14$^-$)	1083.5	(13$^-$)			
235.7 *2*	6.2	425.5	(8$^+$)	189.8	(6$^+$)			
245.9 *2*	7.2	1250.5	(12$^+$)	1004.6	(11$^+$)			
251.3[a] *3*		391.7+x	(10$^-$)	139.90+x	(9$^-$)			
255.8 *2*	8.2	395.7+x	(11$^-$)	139.90+x	(9$^-$)			
261.5 *3*	4.0	1512.0	(13$^+$)	1250.5	(12$^+$)			
261.9 *2*	7.5	1574.8	(15$^-$)	1313.0	(14$^-$)			
268.1 *2*	5.7	694.6	(11$^-$)	426.59	(9$^-$)			
281.9 *2*	7.9	1856.9	(16$^-$)	1574.8	(15$^-$)			
287.7 *3*	3.5	1799.6	(14$^+$)	1512.0	(13$^+$)			
295.3 *2*	5.1	2152.2	(17$^-$)	1856.9	(16$^-$)			
297.1[a] *3*		2096.3	(15$^+$)	1799.6	(14$^+$)			
300.8 *2*	7.2	591.2	(9$^+$)	290.5	(7$^+$)			
317.2 *3*	3.6	2800.0	(19$^-$)	2482.6	(18$^-$)			
319.6 *2*	6.9	711.3+x	(12$^-$)	391.7+x	(10$^-$)			
328.8 *2*	6.7	867.9	(12$^-$)	539.12	(10$^-$)			
330.2 *3*	4.0	2482.6	(18$^-$)	2152.2	(17$^-$)			
361.4 *2*	8.0	786.9	(10$^+$)	425.5	(8$^+$)			
369.8 *2*	6.6	765.5+x	(13$^-$)	395.7+x	(11$^-$)			
388.7 *2*	8.8	1083.5	(13$^-$)	694.6	(11$^-$)			
413.4 *2*	8.9	1004.6	(11$^+$)	591.2	(9$^+$)			
416.9 *2*	7.7	1128.2+x	(14$^-$)	711.3+x	(12$^-$)			
445.3 *2*	9.8	1313.0	(14$^-$)	867.9	(12$^-$)			
463.5 *2*	7.3	1250.5	(12$^+$)	786.9	(10$^+$)			
471.8 *3*	4.3	1237.3+x	(15$^-$)	765.5+x	(13$^-$)			
491.0 *2*	5.6	1574.8	(15$^-$)	1083.5	(13$^-$)			
507.4 *3*	2.8	1512.0	(13$^+$)	1004.6	(11$^+$)			
510.5 *2*	7.0	1638.7+x	(16$^-$)	1128.2+x	(14$^-$)			
544.1 *2*	6.4	1856.9	(16$^-$)	1313.0	(14$^-$)			
549.1 *3*	4.5	1799.6	(14$^+$)	1250.5	(12$^+$)			
557.9 *3*	2.5	1795.2+x	(17$^-$)	1237.3+x	(15$^-$)			
577.4 *2*	4.3	2152.2	(17$^-$)	1574.8	(15$^-$)			
584.3 *3*	3.3	2096.3	(15$^+$)	1512.0	(13$^+$)			
596.3 *2*	5.6	2235.0+x	(18$^-$)	1638.7+x	(16$^-$)			
617.3 *3*	3.1	2416.9	(16$^+$)	1799.6	(14$^+$)			
624.4 *3*	2.3	2419.6+x	(19$^-$)	1795.2+x	(17$^-$)			
625.7 *2*	5.5	2482.6	(18$^-$)	1856.9	(16$^-$)			
642.8 *3*	3.1	2739.1	(17$^+$)	2096.3	(15$^+$)			
647.9 *2*	5.1	2800.0	(19$^-$)	2152.2	(17$^-$)			
652.9 *3*	3.0	3069.8	(18$^+$)	2416.9	(16$^+$)			
667.9 *3*	3.9	2902.9+x	(20$^-$)	2235.0+x	(18$^-$)			
691[a]		3430.1	(19$^+$)	2739.1	(17$^+$)			
699.5 *3*	2.9	3499.5	(21$^-$)	2800.0	(19$^-$)			
720.8[a] *3*	3.9	3623.7+x	(22$^-$)	2902.9+x	(20$^-$)			
721[a]		3203.6	(20$^-$)	2482.6	(18$^-$)			

[†] ΔE=0.1 keV assigned by evaluator if Iγ>10, 0.2 keV if 5<Iγ<10, 0.3 keV if Iγ<5, based on the general comment that 0.1≤ΔE≤0.3 (1992Ho02).

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^{159}Tb(^{12}C,5nγ) 1992Ho02 (continued)

$\gamma(^{166}Lu)$ (continued)

‡ Relative photon intensity for E(^{12}C)=82 MeV; uncertainties range from 10% to 30% (1992Ho02).
# Deduced by authors from intensity balance.
@ Depopulates (7^-) 287.2 and/or (8^-) 341.1 level (1992Ho02). However, existence of transition has not been confirmed In either of two subsequent (HI,xnγ) studies (2000Zh51, 2000Le25).
& 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.
a Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

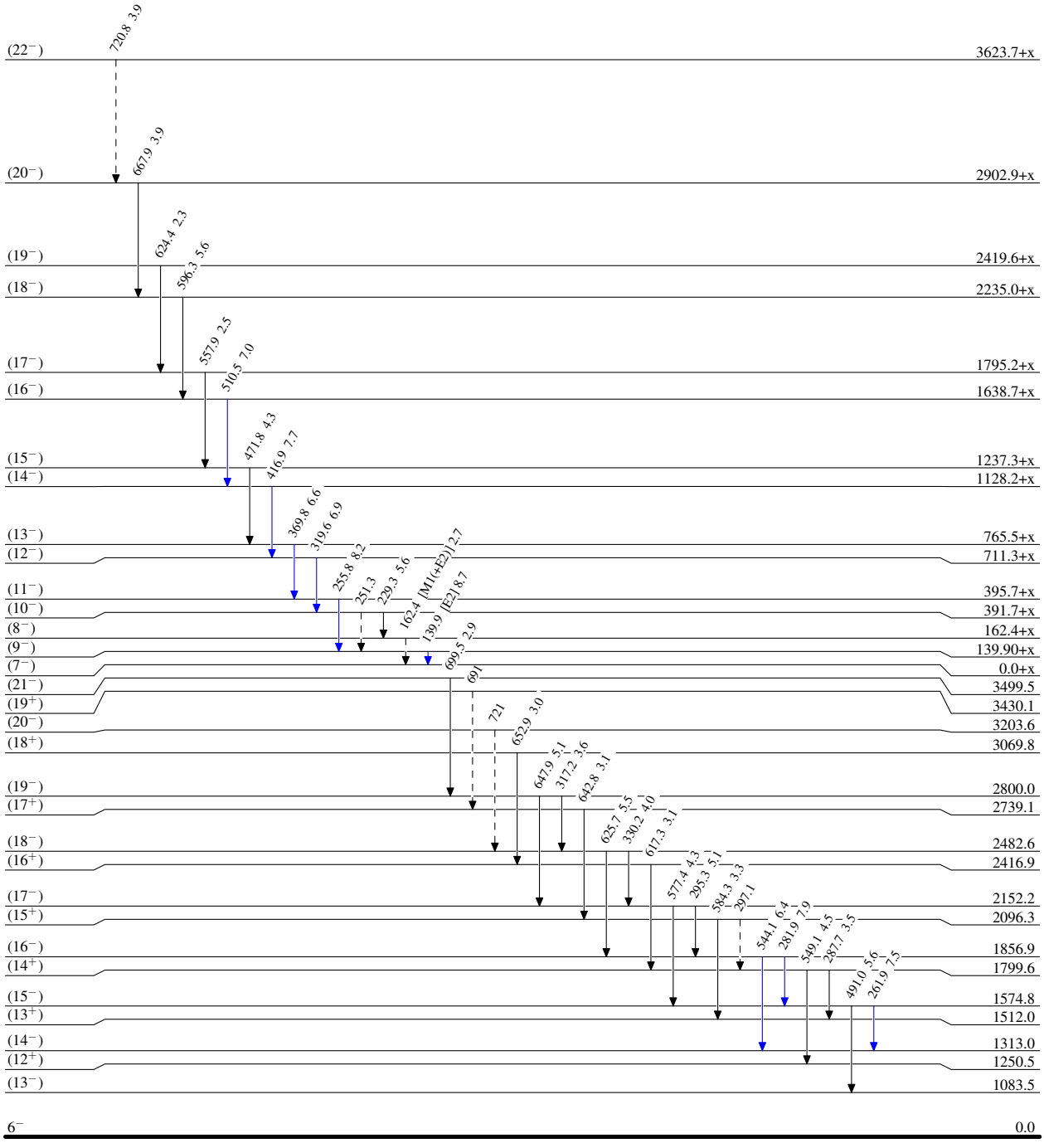
^{159}Tb(^{12}C,5nγ) 1992Ho02

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)



$^{166}_{71}Lu_{95}$

^{159}Tb(^{12}C,5nγ) **1992Ho02**

Level Scheme (continued)

Intensities: Relative I_γ

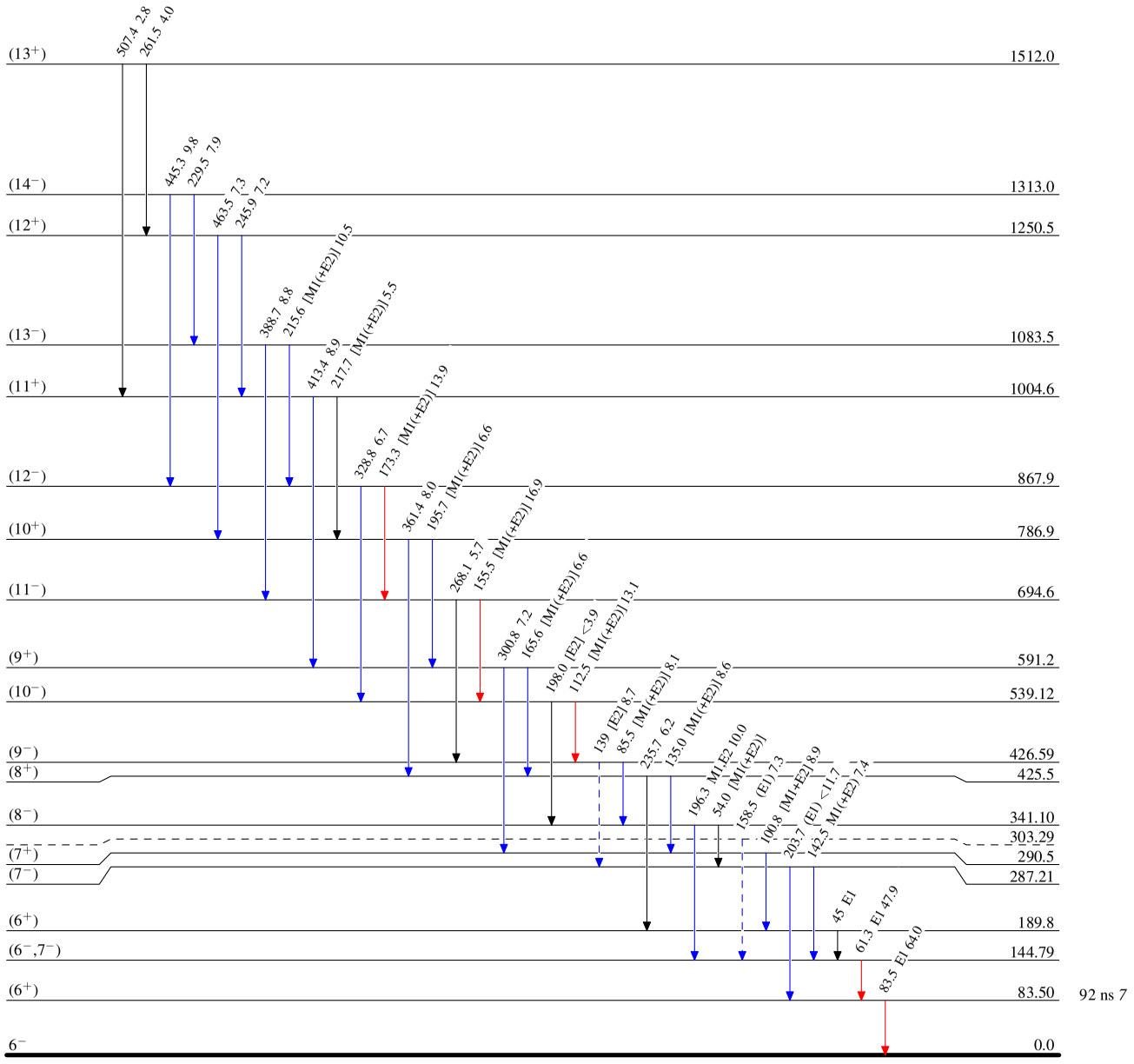
Legend

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

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

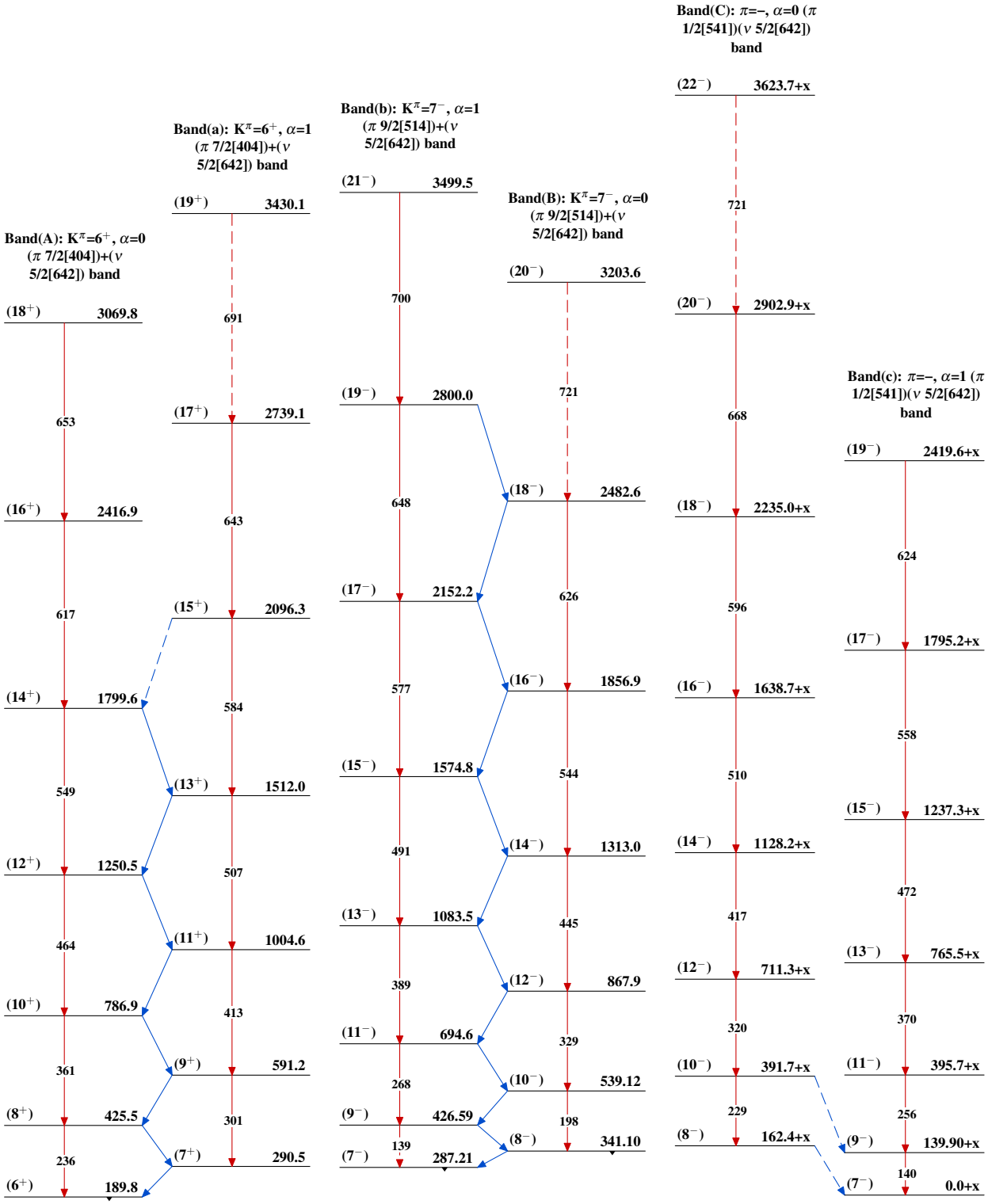
$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{166}_{71}Lu_{95}$

^{159}Tb(^{12}C,5nγ) 1992Ho02



$^{166}_{71}Lu_{95}$