^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, I. Mitropolsky, A. Rodionov	NDS 107, 2715 (2006)	17-Jul-2006

1990Ma07: ^{122}Sn(^{13}C,4nγ), E=57 MeV; measured $\gamma\gamma$, $\gamma(\theta)$, deduced A_2, A_4, DCO. Five Ge detectors, BGO anti-Compton shielding. Cranking model calculations, band assignment.
1975Gi11: ^{122}Sn(^{12}C,3nγ) E=49 MeV; measured Eγ, Iγ, $\gamma(\theta)$, $\gamma\gamma$, deduced A_2, J^π. Ge(Li) detectors. Band assignment.

^{131}Ba Levels

The level scheme is that of 1990Ma07, partly of 1975Gi11, and based on coincidence relationships and relative transition intensities. The spin and parity values are from the angular distribution and correlation data.

E(level)[†]	J$^\pi$	T$_{1/2}$[‡]	Comments
0.0[c]	1/2$^+$	11.50 d *6*	
108.01[c] *16*	3/2$^+$		
187.09[e] *18*	9/2$^-$	14.6 min *2*	
285.10 *20*	3/2$^+$		
286.86[e] *23*	11/2$^-$		
316.49[c] *20*	5/2$^+$		
526.4 *4*	(3/2)$^+$		
543.55[c] *23*	7/2$^+$		
705.86[e] *20*	13/2$^-$		
803.4[c] *3*	9/2$^+$		
898.23[e] *18*	15/2$^-$		
1029.9 *7*	(13/2$^-$)		
1119.08[c] *25*	11/2$^+$		
1349.27[h] *23*	(15/2$^-$)		
1417.89[c] *25*	13/2$^+$		
1458.24[e] *17*	17/2$^-$		
1682.61[e] *17*	19/2$^-$		
1712.7 *6*	(17/2$^-$)		
1796.56[c] *23*	15/2$^+$		
2044.83[h] *17*	(19/2$^-$)		
2108.9[d] *4*	(15/2$^+$)		
2121.85[c] *21*	17/2$^+$		
2319.73[d] *20*	(17/2$^+$)		
2357.72[e] *17*	21/2$^-$		
2460.3 *3*	(19/2)		
2518.95 *22*	(21/2$^-$)		
2533.7[c] *3*	19/2$^+$		
2560.97[d] *18*	(19/2$^+$)		
2611.14[e] *24*	23/2$^-$		
2725.1[i] *3*	(21/2$^+$)		
2795.11[ah] *4*	(23/2$^-$)		Additional information 1.
2795.13[ad] *23*	(21/2$^+$)		Additional information 2.
2862.3[c] *4*	21/2$^+$		
2868.2[@] *4*			
2884.0[&] *4*	(23/2)		
3009.5[@] *5*			
3057.10[d] *20*	(23/2$^+$)		

Continued on next page (footnotes at end of table)

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11 (continued)

^{131}Ba Levels (continued)

E(level)†	Jπ	E(level)†	Jπ	E(level)†	Jπ	E(level)†	Jπ
3119.0# 7		3584.8@ 7		4278.3d 5	(31/2+)	5162.9d 6	(35/2+)
3138.5 8	(23/2−)	3652.7g 4	(27/2−)	4307.5f 5	(29/2−)	5350.9h 6	(35/2−)
3254.6 3	(25/2−)	3656.9& 5	(27/2)	4338.4h 5	(31/2−)	5387.5g 6	(35/2−)
3256.5@ 6		3717.3e 4	27/2−	4410.4?@ 13		5404.1f 7	(35/2−)
3272.3d 4	(25/2+)	3808.1# 13		4501.5g 5	(31/2−)	5489.0& 12	(35/2)
3303.3i 4	(25/2+)	3902.0f 4	(25/2−)	4512.0& 5	(31/2)	5686.9d 9	(37/2+)
3400.7e 3	25/2−	3940.6d 5	(29/2+)	4632.9f 5	(31/2−)	5856.1f 7	(37/2−)
3431.0# 8		3949.3@ 7		4669.8?# 20		6174.6?d 11	(39/2+)
3476.7h 4	(27/2−)	4046.2f 4	(27/2−)	4750.0d 6	(33/2+)	6235.7?i 12	(37/2+)
3510.2b 5	(27/2)	4071.7i 5	(29/2+)	4974.8f 6	(33/2−)	6365.1?f 10	(39/2−)
3555.8d 4	(27/2+)	4205.1# 17		5041.7i 6	(33/2+)	6440.5?g 12	(39/2−)

† From least-squares fit to Eγ′s.
‡ From the Adopted Levels.
# Possible rotational level sequence.
@ Possible rotational level sequence.
& Possible rotational level sequence with ΔJ=2.
a The levels 1795.11, 23/2− and 2795.13, 21/2+ are very close; during least square fitting, at first the level energies were fixed by turns, at final stage both energies were fixed.
b State was assumed in 1994Se10 as a member of rotational band with ΔJ=2. Analysis based on the Variable Moment of Inertia model shows.
c Band(A): ΔJ=1 band, probable Configuration=(ν $s_{1/2}$).
d Band(B): band, Configuration=(N,H11/2)(π,$G_{7/2}$)(π,$H_{11/2}$).
e Band(C): yrast band, Configuration=(ν $h_{11/2}$).
f Band(D): band, Configuration=(N,H11/2)(π,$H_{11/2}$)^2.
g Band(E): ΔJ=2 band, candidate for Configuration=(ν $h_{11/2}$)^3 (GAMMA=−40 DEG).
h Band(F): ΔJ=2 band, candidate for Configuration=(ν $h_{11/2}$)^3 (GAMMA=−80 DEG).
i Band(G): ΔJ=2 band, Configuration=(N,S1/2)($\nu$$H_{11/2}$)^2.

$\gamma(^{131}Ba)$

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	δ #	α d	$I_{(\gamma+ce)}$ †	Comments
(79.05 *12*)		187.09	9/2$^-$	108.01	3/2$^+$	E3		76.2 *11*		E_γ: from ^{131}Ba IT decay, not observed in ^{122}Sn(^{13}C,4nγ), (^{12}C,3nγ).
99.7 *3*	91.1 @	286.86	11/2$^-$	187.09	9/2$^-$	M1(+E2)	−0.01 *4*	0.995 *17*	181.7	Mult.: $\gamma(\theta)$: A_2=−0.30 *4* (1975Gi11). δ: from 1977Kr13.
108.0 *3*	121.7 @	108.01	3/2$^+$	0.0	1/2$^+$	M1+E2	−0.7 *4*	1.01 *17*	244.6	Mult.: $\gamma(\theta)$: A_2=−0.59 *4*, A_4=0.08 *6*.
141.3 *3*	<2.0	3009.5		2868.2						
144.2 *3*	2.2 @	4046.2	(27/2$^-$)	3902.0	(25/2$^-$)	M1+E2	−0.39 *6*	0.375 *9*	3.1	Mult.: $\gamma(\theta)$: A_2=−0.70 *8*, A_4=0.01 *11*.
x173.8 *3*						(D)			7.0	Mult.: $\gamma(\theta)$: A_2=−0.38 *5*, A_4=0.10 *7*.
177.0 c *2*	&	285.10	3/2$^+$	108.01	3/2$^+$	M1,E2		0.23 *4*		I_γ: 3.8 *4* (1975Gi11). Mult.: $\gamma(\theta)$: A_2=0.01 *10* (1975Gi11).
192.3 *3*	14.8 @	898.23	15/2$^-$	705.86	13/2$^-$	M1+E2	−0.24 *12*	0.161 *4*	17.2	Mult.: $\gamma(\theta)$: A_2=−0.56 *4*, A_4=0.12 *6*. δ: +0.02 *4* obtained by 1977Kr13 from data of 1975Gi11.
195 *1*	<2.0	3057.10	(23/2$^+$)	2862.3	21/2$^+$	D				
208.5 *3*	7.7 @&	316.49	5/2$^+$	108.01	3/2$^+$	M1+E2	−0.21 *3*	0.1286 *19*	8.7	Mult.: $\gamma(\theta)$: A_2=−0.41 *4*, A_4=0.09 *6*.
x209 *1*									5.4	
211 *1*	<2.0	2319.73	(17/2$^+$)	2108.9	(15/2$^+$)					
215.1 *3*	25.9 @	3272.3	(25/2$^+$)	3057.10	(23/2$^+$)	M1+E2	−0.12 *5*	0.1176 *18*	29.0	Mult.: $\gamma(\theta)$: A_2=−0.38 *4*, A_4=0.06 *6*.
222 *1*	<2.0	3476.7	(27/2$^-$)	3254.6	(25/2$^-$)					
224.2 *3*	3.4 @	1682.61	19/2$^-$	1458.24	17/2$^-$	M1+E2	−0.19 *10*	0.1054 *17*	3.8	Mult.: $\gamma(\theta)$: A_2=−0.48 *6*, A_4=0.10 *8*. δ: +0.12 *8* obtained by 1977Kr13 from data of 1975Gi11.
227.2 *3*	3.1 @	543.55	7/2$^+$	316.49	5/2$^+$	M1+E2	−0.23 *8*	0.1019 *16*	3.4	Mult.: $\gamma(\theta)$: A_2=−0.47 *7*, A_4+0.05 *9*.
x231 *1*						D			3.7	Mult.: $\gamma(\theta)$: A_2=−0.48 *7*, A_4=0.08 *10*.
234.1 *3*	5.6 @	2795.13	(21/2$^+$)	2560.97	(19/2$^+$)	M1+E2	−0.22 *4*	0.0939	6.1	Mult.: $\gamma(\theta)$: A_2=−0.52 *5*, A_4=0.02 *8*.
241.3 *3*	2.5	2560.97	(19/2$^+$)	2319.73	(17/2$^+$)	D				
247.0 *3*	2.9 @	3256.5		3009.5		(M1,E2)		0.0830 *23*	3.1	Mult.: $\gamma(\theta)$: A_2=−0.5 *7*, A_4=0.03 *10*.
253 *1*	<1.9 @	2611.14	23/2$^-$	2357.72	21/2$^-$	M1,E2		0.0772 *19*	<2.0	
260 *1*	<29.0 a	803.4	9/2$^+$	543.55	7/2$^+$					
261 *1*	<29.0 a	2795.13	(21/2$^+$)	2533.7	19/2$^+$					
261.3 *3*	<27.1 a@	4307.5	(29/2$^-$)	4046.2	(27/2$^-$)	M1,E2		0.0702 *11*	<29.0 a	
261.8 *3*	<27.1 a@	3057.10	(23/2$^+$)	2795.13	(21/2$^+$)	M1,E2		0.0698 *11*	<29.0 a	Mult.: $\gamma(\theta)$: A_2=−0.43 *4*, A_4=0.04 *6* (average values for 261 multiplet).
276.0 *3*	<1.9 @	2795.11	(23/2$^-$)	2518.95	(21/2$^-$)	M1,E2		0.0597 *11*	<2.0	
283.5 *3*	25.1	3555.8	(27/2$^+$)	3272.3	(25/2$^+$)	M1+E2	−0.07 *4*	0.0562	26.5	Mult.: $\gamma(\theta)$: A_2=−0.31 *4*, A_4=0.04 *6*.
285.3 c *3*	&	285.10	3/2$^+$	0.0	1/2$^+$	M1,E2		0.0542 *14*		I_γ: 9.7 *10* (1975Gi11). Mult.: $\gamma(\theta)$: A_2=−0.36 *7* (1975Gi11).
299.0 *3*	2.1 @	1417.89	13/2$^+$	1119.08	11/2$^+$	M1+E2	−0.19 *10*	0.0488	2.2	Mult.: $\gamma(\theta)$: A_2=−0.40 *9*, A_4=−0.07 *2*.
312 *1*	6.8	3431.0		3119.0		D				

$^{131}_{56}Ba_{75}$-3

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11 (continued)

γ(^{131}Ba) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[#]	α[d]	$I_{(\gamma+ce)}$[†]	Comments
316[eb] *1*	<2.0[e]	1119.08	11/2$^+$	803.4	9/2$^+$	D				
316[eb] *1*	<2.0[e]	3717.3	27/2$^-$	3400.7	25/2$^-$					Mult.: $\gamma(\theta)$: A_2=0.20 *5*, A_4=−0.02 *6*.
316.5 *3*	4.8[@&]	316.49	5/2$^+$	0.0	1/2$^+$	E2		0.0382	5.0	
324 *1*	<2.0[a]	3119.0		2795.13	(21/2$^+$)					
325 *1*	<2.0[a]	2121.85	17/2$^+$	1796.56	15/2$^+$					
325.4 *3*	<2.0[a]	4632.9	(31/2$^-$)	4307.5	(29/2$^-$)	D				
328[f] *1*	<2.0	2862.3	21/2$^+$	2533.7	19/2$^+$					
328.3 *3*	<2.0	3584.8		3256.5						
328.9 *3*	<2.0	4046.2	(27/2$^-$)	3717.3	27/2$^-$	D				
332 *1*	<2.0	2044.83	(19/2$^-$)	1712.7	(17/2$^-$)					
337.7 *3*	6.4[@]	4278.3	(31/2$^+$)	3940.6	(29/2$^+$)	M1+E2	−0.12 *12*	0.0356 *6*	6.6	Mult.: $\gamma(\theta)$: A_2=−0.38 *5*, A_4=0.13 *8*.
341.9 *3*	3.7[@]	4974.8	(33/2$^-$)	4632.9	(31/2$^-$)	M1+E2	−0.10 *3*	0.0345	3.8	Mult.: $\gamma(\theta)$: A_2=−0.36 *7*, A_4=0.04 *16*.
363 *1*	<2.0	2044.83	(19/2$^-$)	1682.61	19/2$^-$					
364.5 *3*	<2.0	3949.3		3584.8						
365 *1*	<2.0	2884.0	(23/2)	2518.95	(21/2$^-$)					
377 *1*	3.6	3808.1		3431.0		D				Mult.: $\gamma(\theta)$: A_2=−0.59 *7*, A_4=0.03 *14*.
379 *1*	<2.0	1796.56	15/2$^+$	1417.89	13/2$^+$	D				
384.7 *3*	6.7[@]	3940.6	(29/2$^+$)	3555.8	(27/2$^+$)	M1+E2	−0.34 *5*	0.0250	6.9	Mult.: $\gamma(\theta)$: A_2=−0.64 *5*, A_4=0.02 *7*.
397 *1*	2.8	4205.1		3808.1		D				
412[f] *1*	<2.0	2533.7	19/2$^+$	2121.85	17/2$^+$					
412.8 *3*	3.9[@]	5162.9	(35/2$^+$)	4750.0	(33/2$^+$)	M1,E2		0.0191 *22*	4.0	Mult.: $\gamma(\theta)$: A_2=−0.23 *7*, A_4=0.08 *10*.
415 *1*	<2.0	2460.3	(19/2)	2044.83	(19/2$^-$)					
[x]417 *1*	10.9[@]					(E2)		0.0165 *3*	11.1	
418.8[c] *4*	[&]	526.4	(3/2)$^+$	108.01	3/2$^+$					I_γ: 72.5 *73* (1975Gi11, composite line).
419.0 *3*	73.9[@]	705.86	13/2$^-$	286.86	11/2$^-$	M1+E2	−0.32 *7*	0.0201 *4*	75.4	Mult.: $\gamma(\theta)$: A_2=−0.65 *4*, A_4=0.06 *6*.
423.7 *3*	9.1[@]	2884.0	(23/2)	2460.3	(19/2)	E2		0.01575	9.2	Mult.: $\gamma(\theta)$: A_2=0.32 *6*, A_4=−0.04 *7*.
429.3 *3*	2.5	5404.1	(35/2$^-$)	4974.8	(33/2$^-$)	D				
435.7 *3*	20.1[@]	543.55	7/2$^+$	108.01	3/2$^+$	E2		0.01453	20.4	Mult.: $\gamma(\theta)$: A_2=0.19 *5*, A_4=−0.07 *6*.
[x]436 *1*	<2.0									
437.3 *3*	3.9	2795.11	(23/2$^-$)	2357.72	21/2$^-$	D				
451.0 *3*	<2.0	1349.27	(15/2$^-$)	898.23	15/2$^-$					
452.0 *3*	2.8	5856.1	(37/2$^-$)	5404.1	(35/2$^-$)	M1+E2	−0.17 *3*	0.01683		Mult.: $\gamma(\theta)$: A_2=−0.44 *9*, A_4=0.03 *12*.
459.5 *3*	3.4[@]	3254.6	(25/2$^-$)	2795.11	(23/2$^-$)	M1,E2		0.0144 *19*	3.5	
461[f] *1*	<2.0	4410.4?		3949.3						
465[f] *1*	<2.0	4669.8?		4205.1						
471.7 *3*	4.0[@]	4750.0	(33/2$^+$)	4278.3	(31/2$^+$)	M1,E2		0.0134 *19*	4.1	Mult.: $\gamma(\theta)$: A_2=−0.70 *7*, A_4=0.12 *10*.
474.0 *3*	5.6[@]	2518.95	(21/2$^-$)	2044.83	(19/2$^-$)	M1,E2		0.0132 *19*	5.7	
475.2 *3*	<2.0	2795.13	(21/2$^+$)	2319.73	(17/2$^+$)					

$^{131}_{56}Ba_{75}$-4

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11 (continued)

$\gamma(^{131}Ba)$ (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	δ [#]	α [d]	$I_{(\gamma+ce)}$ [†]	Comments
477 *1*	<2.0	3272.3	(25/2$^+$)	2795.13	(21/2$^+$)					
486.8 *3*	9.7 [@]	803.4	9/2$^+$	316.49	5/2$^+$	E2		0.01061	9.8	Mult.: $\gamma(\theta)$: A_2=0.25 *6*, A_4=0.02 *7*.
487 [f] *1*	<2.0	6174.6?	(39/2$^+$)	5686.9	(37/2$^+$)					
496 *1*	<2.0	3057.10	(23/2$^+$)	2560.97	(19/2$^+$)					
499 *1*	<2.0	3555.8	(27/2$^+$)	3057.10	(23/2$^+$)					
501.2 *3*	2.9	3902.0	(25/2$^-$)	3400.7	25/2$^-$	D				
509 [f] *1*	<2.0	6365.1?	(39/2$^-$)	5856.1	(37/2$^-$)					
518.6 *3*	7.2 [@]	705.86	13/2$^-$	187.09	9/2$^-$	E2		0.00892	7.3	Mult.: $\gamma(\theta)$: A_2=0.34 *6*, A_4=−0.09 *8*.
523.5 *3*	<2.0	3057.10	(23/2$^+$)	2533.7	19/2$^+$	(E2)		0.00869		
524 *1*	3.3	5686.9	(37/2$^+$)	5162.9	(35/2$^+$)	M1,E2		0.0102 *16*		
525.8 [c] *5*	&	526.4	(3/2)$^+$	0.0	1/2$^+$					I_γ: 4.8 *5* (1975Gi11). Mult.: $\gamma(\theta)$: A_2=0.23 *10* (1975Gi11).
[x]544.8 *3*	6.0					D				
549 *1*	2.2	2868.2		2319.73	(17/2$^+$)					
560.0 *3*	28.9 [@]	1458.24	17/2$^-$	898.23	15/2$^-$	M1+E2	−0.42 *9*	0.00954 *21*	29.2	Mult.: $\gamma(\theta)$: A_2=−0.73 *4*, A_4=0.06 *6*. δ: −0.25 *12* obtained by 1977Kr13 from data of 1975Gi11.
575.8 *3*	17.8 [@]	1119.08	11/2$^+$	543.55	7/2$^+$	E2		0.00674	17.9	Mult.: $\gamma(\theta)$: A_2=0.31 *6*, A_4=0.02 *7*.
578.2 *3*	5.6	3303.3	(25/2$^+$)	2725.1	(21/2$^+$)	E2		0.00667		Mult.: $\gamma(\theta)$: A_2=0.28 *7*, A_4=0.05 *8*.
586.8 *3*	13.4 [@]	2044.83	(19/2$^-$)	1458.24	17/2$^-$	M1+E2	−0.32 *7*	0.00864 *16*	13.5	Mult.: $\gamma(\theta)$: A_2=−0.63 *5*, A_4=0.07 *7*.
587 *1*	<2.0	4632.9	(31/2$^-$)	4046.2	(27/2$^-$)					
[x]593 *1*	4.6					(E2)		0.00624		
603.0 *3*	4.8	2725.1	(21/2$^+$)	2121.85	17/2$^+$	(E2)		0.00598		
[x]605 *1*										
[x]608 *1*										
611.3 *3*	99.4 [@]	898.23	15/2$^-$	286.86	11/2$^-$	E2		0.00577	100.0	Mult.: $\gamma(\theta)$: A_2=0.31 *5*, A_4=−0.04 *6*.
614.4 *3*	8.9 [@]	1417.89	13/2$^+$	803.4	9/2$^+$	E2		0.00570	9.0	
626.1 *3*	5.2	3510.2	(27/2)	2884.0	(23/2)	E2		0.00543		Mult.: $\gamma(\theta)$: A_2=0.39 *8*, A_4=0.02 *9*.
636 *1*	<2.0	3431.0		2795.13	(21/2$^+$)					
643.5 *3*	21.3 [@]	1349.27	(15/2$^-$)	705.86	13/2$^-$	M1+E2	−0.32 *9*	0.00690 *15*	21.4	Mult.: $\gamma(\theta)$: A_2=−0.64 *4*, A_4=0.10 *6*.
662 *1*	<2.0	3272.3	(25/2$^+$)	2611.14	23/2$^-$					
667 *1*	<2.0	4974.8	(33/2$^-$)	4307.5	(29/2$^-$)					
668 *1*	<2.0	3940.6	(29/2$^+$)	3272.3	(25/2$^+$)					
673.5 *3*	<2.0	2795.13	(21/2$^+$)	2121.85	17/2$^+$	(E2)		0.00452		
675.0 *3*	9.5 [@]	2357.72	21/2$^-$	1682.61	19/2$^-$	M1+E2	−0.49 *14*	0.00596 *19*	9.6	Mult.: $\gamma(\theta)$: A_2=−0.78 *6*, A_4=0.09 *8*.
677.6 *3*	14.2 [@]	1796.56	15/2$^+$	1119.08	11/2$^+$	E2		0.00445	14.3	Mult.: $\gamma(\theta)$: A_2=0.24 *6*, A_4=−0.02 *7*.
[x]678 *1*						(E2)		0.00445		
680.5 *3*	5.8	2725.1	(21/2$^+$)	2044.83	(19/2$^-$)	(E1)		1.65×10^{-3}		
682 *1*	5.4	3476.7	(27/2$^-$)	2795.11	(23/2$^-$)	E2		0.00438		
683 *1*		1712.7	(17/2$^-$)	1029.9	(13/2$^-$)					

$^{131}_{56}Ba_{75}$-5

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11 (continued)

γ(^{131}Ba) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	δ #	α d	$I_{(\gamma+ce)}$ †	Comments
695.6 *3*	11.1	2044.83	(19/2$^-$)	1349.27	(15/2$^-$)	E2		0.00417		Mult.: $\gamma(\theta)$: A_2=0.21 *6*, A_4=−0.02 *7*.
699.4 *3*	5.5	3057.10	(23/2$^+$)	2357.72	21/2$^-$	(E1)		1.55×10^{-3}		
704.0 b *3*	7.3	2121.85	17/2$^+$	1417.89	13/2$^+$	E2		0.00405		Mult.: $\gamma(\theta)$: A_2=0.17 *5*, A_4=0.06 *6*.
722.6 *3*	3.7	4278.3	(31/2$^+$)	3555.8	(27/2$^+$)	E2		0.00380		
736 *1*	<2.0	3254.6	(25/2$^-$)	2518.95	(21/2$^-$)					
737.2 *3*	8.4	2533.7	19/2$^+$	1796.56	15/2$^+$	E2		0.00363		Mult.: $\gamma(\theta)$: A_2=0.26 *6*, A_4=−0.05 *8*.
740.5 *3*	3.1	2862.3	21/2$^+$	2121.85	17/2$^+$	E2		0.00359		
743 *1*	3.3	1029.9	(13/2$^-$)	286.86	11/2$^-$	(M1,E2)		0.0043 *8*		
748 *1*	<2.0	2460.3	(19/2)	1712.7	(17/2$^-$)					
750 *1*		2795.13	(21/2$^+$)	2044.83	(19/2$^-$)					
750.5 *3*	6.5	2795.11	(23/2$^-$)	2044.83	(19/2$^-$)	E2		0.00347		
752.2 *3*	<19.9 @	1458.24	17/2$^-$	705.86	13/2$^-$	E2		0.00345	<20.0	Mult.: $\gamma(\theta)$: A_2=0.31 *6*, A_4=0.06 *7*.
761 *1*	<2.0	3119.0		2357.72	21/2$^-$					
764.5 *3*	3.5	2560.97	(19/2$^+$)	1796.56	15/2$^+$	(E2)		0.00332		Mult.: $\gamma(\theta)$: A_2=0.32 *9*, A_4=0.05 *11*.
768.4 *3*	3.4	4071.7	(29/2$^+$)	3303.3	(25/2$^+$)	E2		0.00328		
771 *1*	<2.0	5404.1	(35/2$^-$)	4632.9	(31/2$^-$)					
772.9 *3*	<2.0	3656.9	(27/2)	2884.0	(23/2)	E2		0.00324		
777.7 *3*	6.4	2460.3	(19/2)	1682.61	19/2$^-$	(D)				Mult.: $\gamma(\theta)$: A_2=0.40 *6*, A_4=0.09 *8*.
784.4 *3*	56.0 @	1682.61	19/2$^-$	898.23	15/2$^-$	E2		0.00313	56.2	Mult.: $\gamma(\theta)$: A_2=0.34 *6*, A_4=−0.05 *6*.
x787.5 *3*	<2.0					(E2)		0.00310		
789.5 b *3*	4.1	3400.7	25/2$^-$	2611.14	23/2$^-$	M1+E2	−0.56 *13*	0.00404 *12*		Mult.: $\gamma(\theta)$: A_2=−0.80 *8*, A_4=0.11 *11*.
806 *1*	<2.0	2518.95	(21/2$^-$)	1712.7	(17/2$^-$)					
809 *1*	<2.0	4750.0	(33/2$^+$)	3940.6	(29/2$^+$)					
820 f *1*	<2.0	3431.0		2611.14	23/2$^-$					
x834 *1*										
843 *1*		1029.9	(13/2$^-$)	187.09	9/2$^-$	(E2)		0.00265		
x844 *1*										
848.8 *3*	5.0	4501.5	(31/2$^-$)	3652.7	(27/2$^-$)	E2		0.00261		
855.2 *3*	<2.0	4512.0	(31/2)	3656.9	(27/2)	E2		0.00256		
858 *1*	<2.0	3652.7	(27/2$^-$)	2795.13	(21/2$^+$)					
861.7 *3*	4.3	4338.4	(31/2$^-$)	3476.7	(27/2$^-$)	E2		0.00252		Mult.: $\gamma(\theta)$: A_2=0.30 *8*, A_4=−0.01 *9*.
865.5 *3*	5.1	3476.7	(27/2$^-$)	2611.14	23/2$^-$	(E2)		0.00249		Mult.: $\gamma(\theta)$: A_2=0.25 *7*, A_4=−0.04 *8*.
881 *1*	<2.0	5856.1	(37/2$^-$)	4974.8	(33/2$^-$)					
885 *1*	<2.0	5162.9	(35/2$^+$)	4278.3	(31/2$^+$)					
886.0 *3*	<2.0	5387.5	(35/2$^-$)	4501.5	(31/2$^-$)	E2		0.00236		
897 *1*	<2.0	3254.6	(25/2$^-$)	2357.72	21/2$^-$					
899.5 *3*	10.0	2357.72	21/2$^-$	1458.24	17/2$^-$	E2		0.00229		Mult.: $\gamma(\theta)$: A_2=0.27 *6*, A_4=−0.05 *7*.
908 *1*	<2.0	4046.2	(27/2$^-$)	3138.5	(23/2$^-$)					
928.5 *3*	16.8	2611.14	23/2$^-$	1682.61	19/2$^-$	E2		0.00213		Mult.: $\gamma(\theta)$: A_2=0.25 *6*, A_4=−0.06 *7*.
937 *1*	<2.0	5686.9	(37/2$^+$)	4750.0	(33/2$^+$)					
961 f *1*	<2.0	6365.1?	(39/2$^-$)	5404.1	(35/2$^-$)					
970.0 *3*	2.6 *6*	5041.7	(33/2$^+$)	4071.7	(29/2$^+$)	E2		0.00193		

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11 (continued)

γ(^{131}Ba) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ#	αd	Comments
977 *1*	<2.0	5489.0	(35/2)	4512.0	(31/2)	E2		0.00190	
1001.8 *3*	6.7	4512.0	(31/2)	3510.2	(27/2)	E2		0.00180	
1002 *1*	<2.0	2460.3	(19/2)	1458.24	17/2$^-$				
1012[f] *1*	<2.0	6174.6?	(39/2$^+$)	5162.9	(35/2$^+$)				
1012.5 *3*		5350.9	(35/2$^-$)	4338.4	(31/2$^-$)	E2		1.76×10^{-3}	
x1038 *1*	<2.0					(E2)		1.67×10^{-3}	
1041.5 *3*	5.4	3652.7	(27/2$^-$)	2611.14	23/2$^-$	(E2)		1.66×10^{-3}	
1042 *1*	<2.0	2725.1	(21/2$^+$)	1682.61	19/2$^-$				
1043.0 *3*	2.5	3400.7	25/2$^-$	2357.72	21/2$^-$	E2		1.65×10^{-3}	
1053 *1*	<2.0	6440.5?	(39/2$^-$)	5387.5	(35/2$^-$)				
1075 *1*	<2.0	2533.7	19/2$^+$	1458.24	17/2$^-$	E1		6.65×10^{-4}	
1094 *1*	<2.0	3138.5	(23/2$^-$)	2044.83	(19/2$^-$)				
1102.5 *3*	5.6	2560.97	(19/2$^+$)	1458.24	17/2$^-$	(E1+M2)	+0.04 *12*	0.00064 *10*	Mult.: $\gamma(\theta)$: A_2=−0.15 *6*, A_4=−0.13 *8*.
1106.2 *3*	3.6	3717.3	27/2$^-$	2611.14	23/2$^-$	E2		1.46×10^{-3}	Mult.: $\gamma(\theta)$: A_2=0.37 *8*, A_4=−0.06 *10*.
1111.5[bf] *3*	<2.0	2795.11	(23/2$^-$)	1682.61	19/2$^-$				E_γ: poor fit, level energy difference is equal to 1112.10 *19*.
1112.5[b] *3*	12.8	2795.13	(21/2$^+$)	1682.61	19/2$^-$	D			
x1132 *1*	<2.0								
x1180 *1*	<2.0								
1185.5 *3*	<2.0	2868.2		1682.61	19/2$^-$				
1194[f] *1*	<2.0	6235.7?	(37/2$^+$)	5041.7	(33/2$^+$)				
x1222 *1*	<2.0					(E2)		1.20×10^{-3}	
1251 *1*	<2.0	4046.2	(27/2$^-$)	2795.11	(23/2$^-$)	(E2)		1.15×10^{-3} *2*	
1403.0 *3*	1.7	2108.9	(15/2$^+$)	705.86	13/2$^-$	(E1+M2)	−0.03 *6*	5.64×10^{-4} *17*	Mult.: $\gamma(\theta)$: A_2=−0.27 *7*, A_4=0.06 *14*.
1421.4 *3*	3.7	2319.73	(17/2$^+$)	898.23	15/2$^-$	(E1+M2)	−0.05 *5*	5.71×10^{-4} *17*	Mult.: $\gamma(\theta)$: A_2=−0.30 *7*, A_4=−0.05 *10*.
1435 *1*	<2.0	4046.2	(27/2$^-$)	2611.14	23/2$^-$	(E2)		9.18×10^{-4}	
1545 *1*	<2.0	3902.0	(25/2$^-$)	2357.72	21/2$^-$	(E2)		8.41×10^{-4}	

† From 1990Ma07, except as noted. Iγ's given in comments are relative to Iγ(99.7γ)=100 *10* (1975Gi11).
‡ From $\gamma(\theta)$ and DCO measurements (1990Ma07), except as noted. E2 is assumed for quadrupole transitions, and M1+E2 is assumed for D+Q transitions within a band.
# From $\gamma(\theta)$ (1990Ma07), except as noted.
@ From I(γ+ce) and adopted α's (evaluators).
& Iγ(177γ)/Iγ(285γ)=0.39 *6*, Iγ(209γ)/Iγ(316γ)=0.62, and Iγ(526γ)/Iγ(418γ)=0.0066 *10* from 1975Gi11 discrepant with 0. 0.288 *15*, and 0.486 *15* from ε decay.
[a] Multiplet.
[b] Doublet with a transition in ^{132}Ba.
[c] From 1975Gi11.

$^{131}_{56}Ba_{75}$-7

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11 (continued)

γ(^{131}Ba) (continued)

[d] 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.
[e] Multiply placed with undivided intensity.
[f] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{131}_{56}Ba_{75}$-8

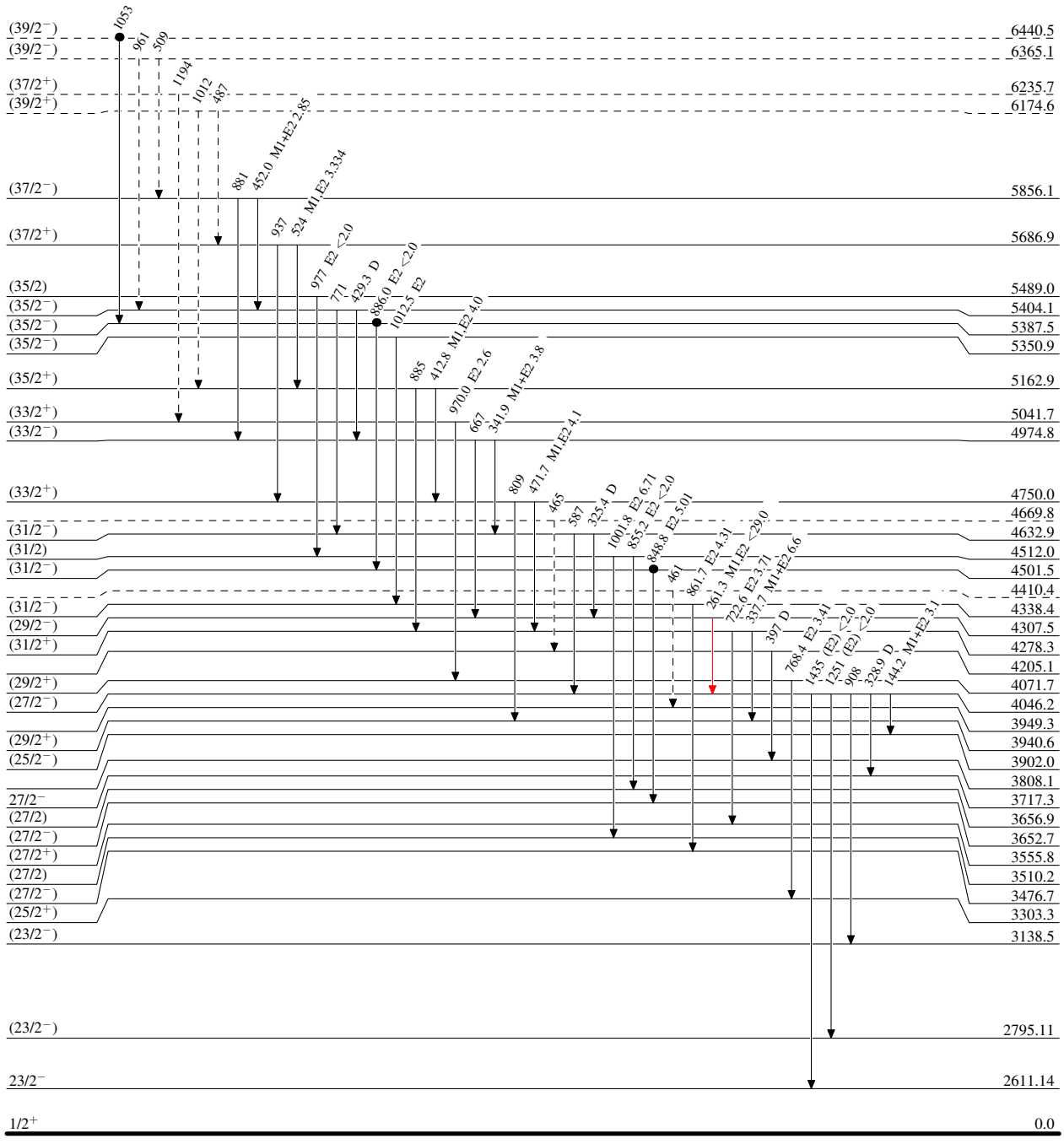
^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11

Level Scheme

Intensities: Relative $I_{(\gamma+ce)}$

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)
- Coincidence



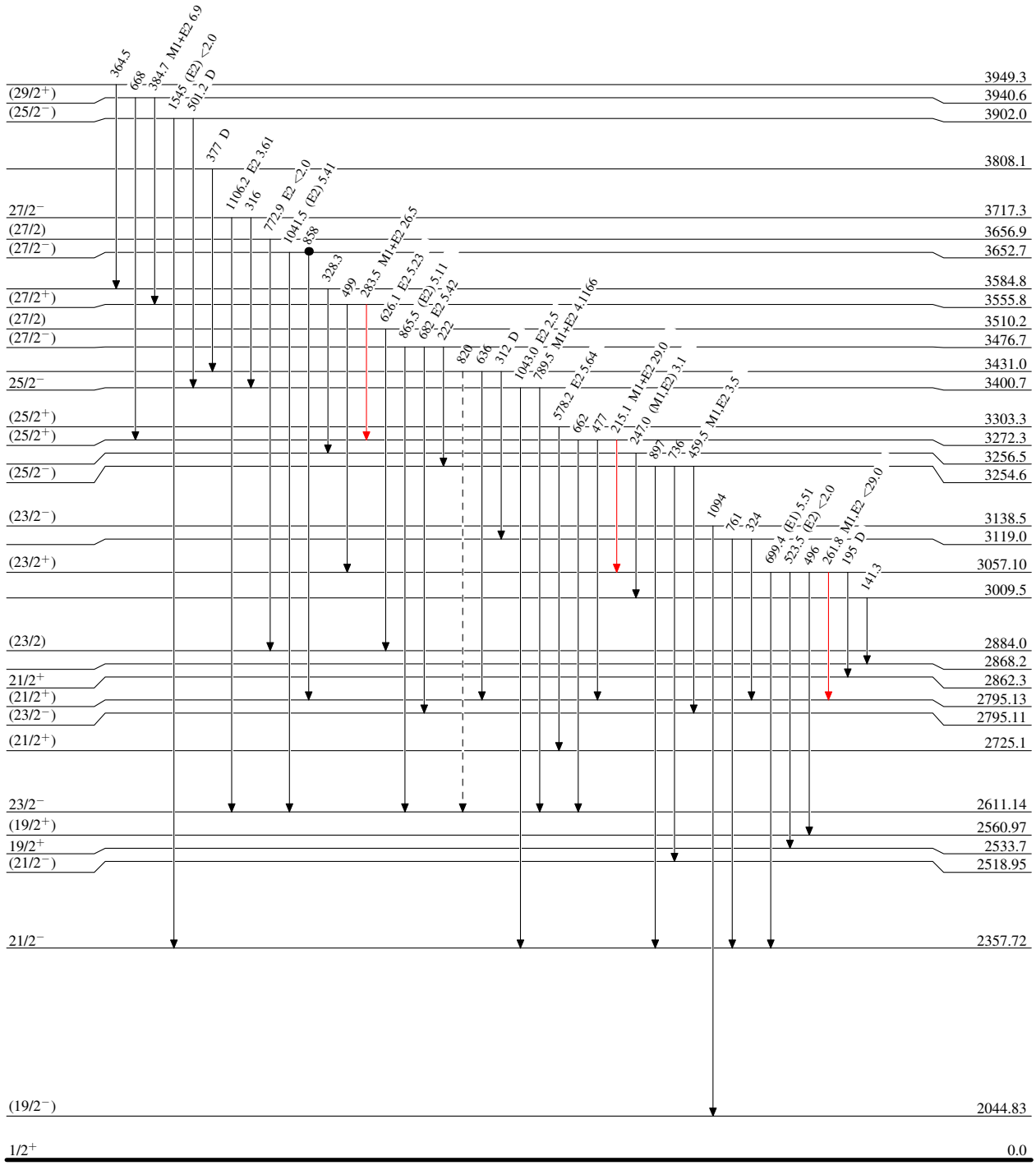
$^{131}_{56}Ba_{75}$

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11

Level Scheme (continued)

Intensities: Relative $I_{(\gamma+ce)}$

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)
- Coincidence

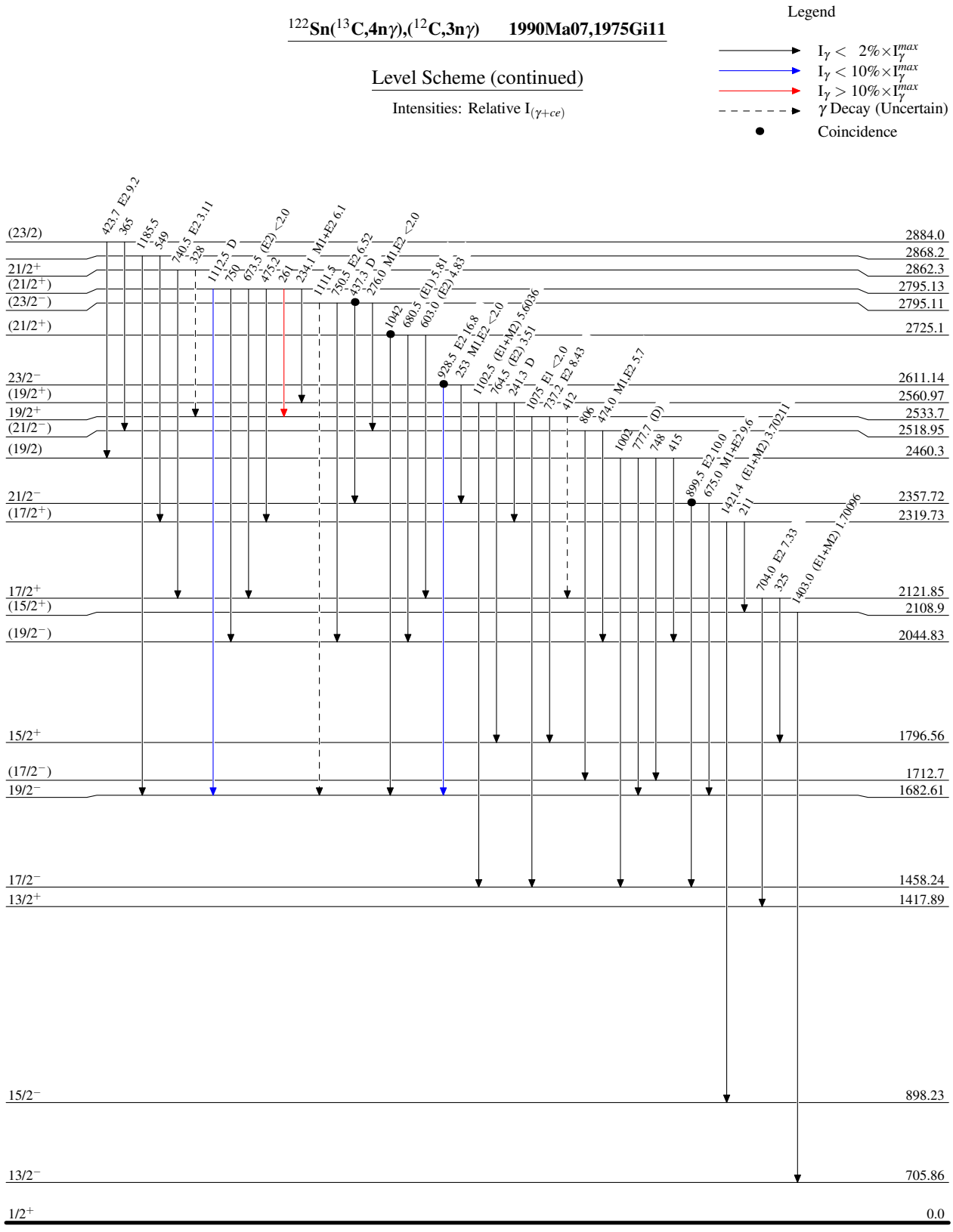


$^{131}_{56}Ba_{75}$

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11

Level Scheme (continued)

Intensities: Relative $I_{(\gamma+ce)}$

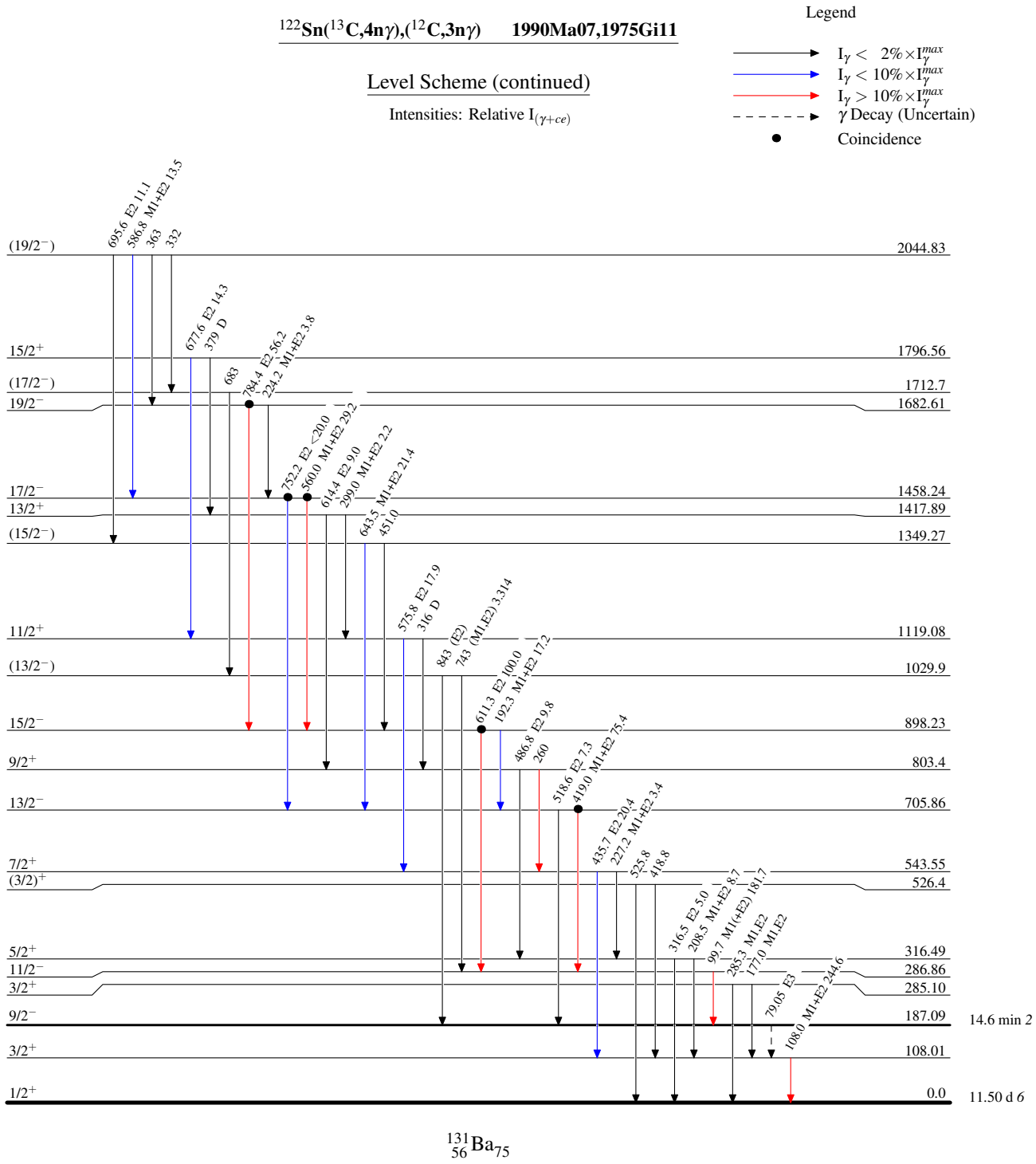


$^{131}_{56}Ba_{75}$

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) **1990Ma07,1975Gi11**

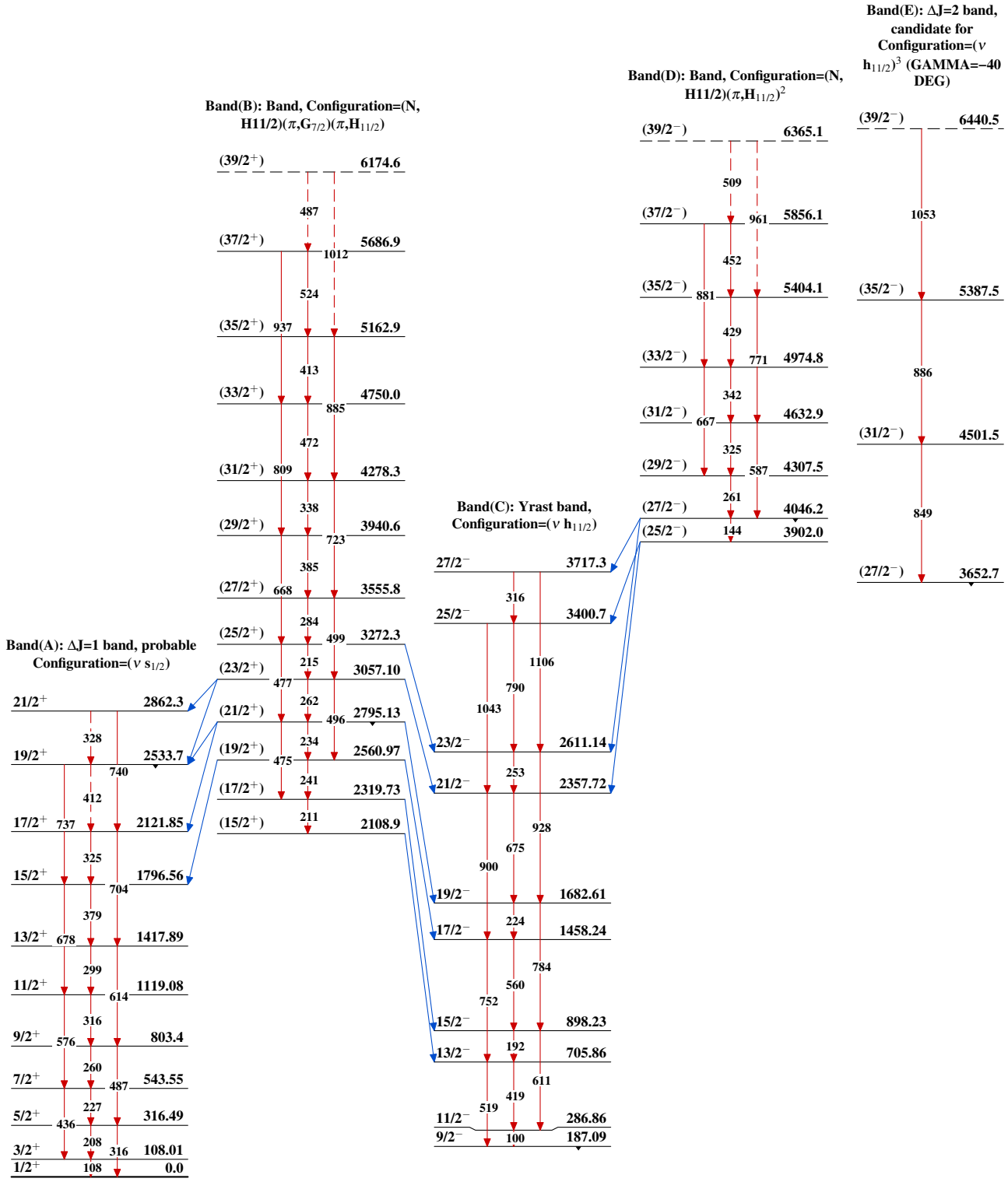
Level Scheme (continued)

Intensities: Relative $I_{(\gamma+ce)}$



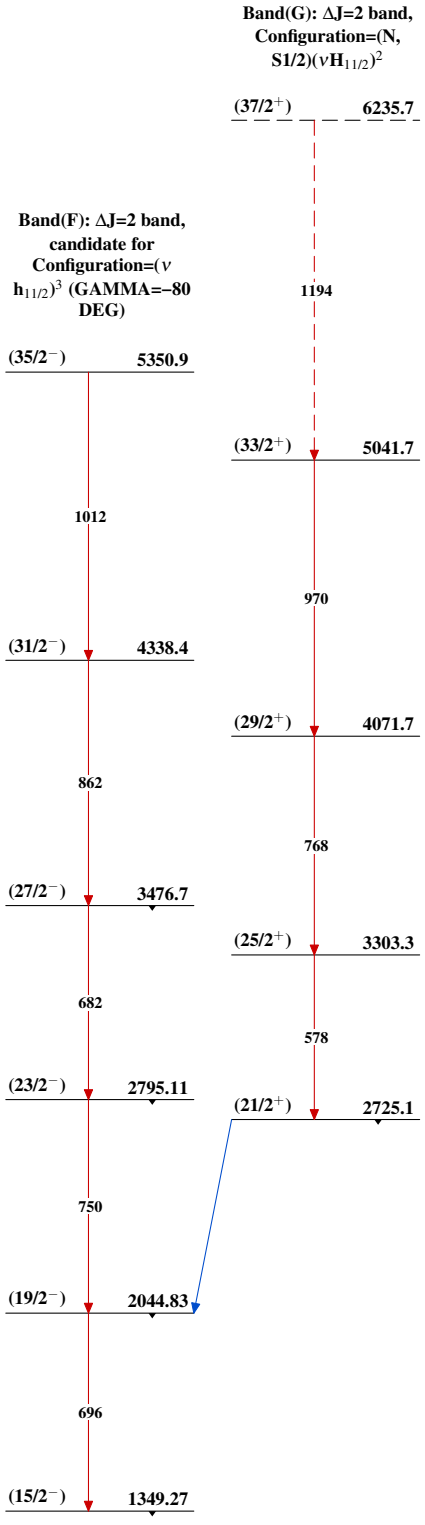
$^{131}_{56}Ba_{75}$

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11



$^{131}_{56}Ba_{75}$

^{122}Sn(^{13}C,4nγ),(^{12}C,3nγ) 1990Ma07,1975Gi11 (continued)



$^{131}_{56}Ba_{75}$