^{124}Sn(^{28}Si,p4nγ) 2001Po18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh	NDS 181, 1 (2022)	9-Mar-2022

2001Po18: E=125 MeV; measured Eγ, Iγ, $\gamma\gamma$ and $\gamma\gamma(\theta)$(DCO) using GASP spectrometer in configuration II consisting of 40 Compton-suppressed HPGe detectors.

^{147}Eu Levels

E(level)[†]	J$^\pi$[‡]	Comments
0.0	5/2$^+$[#]	configuration=$\pi d^{-1}_{5/2}$.
229.67 *17*	7/2$^+$[#]	configuration=$\pi g^{-1}_{7/2}$.
625.33[@] *17*	11/2$^-$[#]	
1346.3[@] *3*	15/2$^-$[#]	
1926.5[@] *4*	19/2$^{(-)}$	
2292.9[@] *4*	23/2$^{(-)}$	
2347.5[@] *4*	21/2$^{(-)}$	
2504.5[a] *4*	19/2$^{(+)}$	
2845.0 *5*	23/2$^{(-)}$	configuration=$\pi d^{-1}_{5/2}\nu f^2_{7/2}$ coupled to 3$^-$ state.
2900.4[&] *4*	27/2$^{(-)}$	
2996.2[a] *4*	23/2$^{(+)}$	
3190.6[&] *5*	25/2$^{(-)}$	
3229.9[a] *4*	27/2$^{(+)}$	
3523.4[a] *4*	29/2$^{(+)}$	
3794.9 *5*	31/2$^{(+)}$	configuration=$\pi h_{11/2}\nu f_{7/2}i_{13/2}$.
4177.8 *5*	33/2$^{(+)}$	configuration=$\pi h_{11/2}\nu f_{7/2}h_{11/2}$ coupled to 3$^-$ octupole state.
4242.4 *5*	31/2$^{(-)}$	configuration=$\pi h_{11/2}\nu f^2_{7/2}$ coupled to 3$^-$ x 3$^-$ double-octupole state.
4283.9 *5*	31/2$^{(-)}$	configuration=$\pi h_{11/2}d^{-1}_{5/2}g^{-1}_{7/2}\nu f^2_{7/2}$.
4612.1 *5*	33/2$^{(+)}$	
4639.4 *5*	33/2$^{(-)}$	Possible configuration=$\pi h_{11/2}d^{-1}_{5/2}g^{-1}_{7/2}\nu f^2_{7/2}$.
4677.6 *5*	(35/2)	
4801.2 *5*	33/2$^{(+)}$	
4862.3 *5*	35/2	
4881.1 *5*	35/2	
4907.5 *5*	35/2	
5056.5 *5*	35/2$^{(+)}$	
5082.6 *5*	37/2$^{(+)}$	
5176.2 *6*	35/2,39/2	
5333.5 *5*	37/2$^{(+)}$	
5373.1 *5*	35/2,39/2	
5381.0 *5*	37/2$^{(+)}$	
5432.0 *5*		
5455.8 *5*	37/2	
5594.9[b] *5*	39/2$^{(+)}$	
5685.5 *6*		
5771.6[b] *5*	41/2$^{(+)}$	
6024.5 *7*		
6333.4[b] *5*	43/2$^{(+)}$	
6510.0 *5*	43/2	
6663.9 *6*	43/2	
6713.1 *6*	43/2	
6847.4 *5*	45/2	
6962.8[d] *6*	45/2$^{(+)}$	

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^{124}Sn(^{28}Si,p4nγ) 2001Po18 (continued)

^{147}Eu Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
6966.1[c] 6	45/2(−)	7681.7[c] 6	49/2(−)	8727.2[d] 7	
7168.4[c] 6	47/2(−)	8512.0[d] 7		8776.7[d] 7	53/2(−)
7419.6[d] 6		8612.9[d] 7	51/2(−)	9268.9[d] 7	
				9643.2[d] 7	

† From least-squares fit to Eγ's, assuming Δ(Eγ)=0.2 keV for Iγ>6 and 0.3 keV for Iγ<6, based on a general comment by 2001Po18.

‡ J values from γ multipolarities as determined by 2001Po18 (see Adopted Levels for adopted J^π values); π values up to 6333 keV from comparison with ^{149}Tb isotone; above 6333 keV from shell model calculations and structure arguments. All π's are considered tentative by evaluator, except when noted.

From 2001Po18 who cite 1992De38 (same as currently adopted).

@ Seq.(D): Member of configuration=$\pi h_{11/2}\nu f^2_{7/2}$.

& Seq.(E): Member of configuration=$\pi h_{11/2}\nu f_{7/2}h_{11/2}$.

a Band(A): Member of configuration=$\pi h_{11/2}\nu f^2_{7/2}$ coupled to 3^- octupole state.

b Band(B): Member of configuration=$\pi h^2_{11/2}g^{-1}_{7/2}\nu f_{7/2}h_{11/2}$.

c Band(C): Member of configuration=$\pi h^2_{11/2}g^{-1}_{7/2}\nu h_{11/2}i_{13/2}$.

d Member of 7-quasiparticle structure: $\pi^2\pi^{-3}\nu^2$. Among these 6963 and 7420 are assigned $\pi h^2_{11/2}g^{-1}_{7/2}\ j^{-2}_{2+}\nu f_{7/2}h_{11/2}$; and 8512, 8612, 8727 and 8776 levels are are assigned $\pi h^2_{11/2}g^{-1}_{7/2}j^{-2}_{2+}\nu h_{11/2}i_{13/2}$.

γ(^{147}Eu)

DCO=$I_{34°}$(gated at 90°)/$I_{90°}$(gated at 34°); 2001Po18 use stretched Q gates for which DCO=1.0 indicates Q transition, and DCO=0.5 indicates D transition.

Eγ	Iγ	E_i(level)	J^π_i	E_f	J^π_f	Mult.†	Comments
(40)	2.4‡	3229.9	27/2(+)	3190.6	25/2(−)		unobserved transition firmly established from coincidence results.
(54)	1.8‡	2347.5	21/2(−)	2292.9	23/2(−)		
119	≈1	6966.1	45/2(−)	6847.4	45/2		
134.3 *3*	1.6 *9*	6847.4	45/2	6713.1	43/2	D	DCO=0.61 *32*.
139.3 *3*	3.4 *19*	5594.9	39/2(+)	5455.8	37/2	(D)	DCO=0.66 *32*.
162.4 *3*	1.5 *8*	5594.9	39/2(+)	5432.0			
164.0 *3*	0.9 *7*	8776.7	53/2(−)	8612.9	51/2(−)		
176.8 *2*	18.0 *25*	5771.6	41/2(+)	5594.9	39/2(+)	D	DCO=0.51 *8*.
183.4 *3*	2.9 *11*	6847.4	45/2	6663.9	43/2	D	DCO=0.63 *18*.
201.7 *3*	3.3 *17*	5082.6	37/2(+)	4881.1	35/2	D	DCO=0.48 *17*.
202.3 *2*	6.3 *13*	7168.4	47/2(−)	6966.1	45/2(−)	D	DCO=0.46 *14*.
213.7 *2*	8.3 *7*	5594.9	39/2(+)	5381.0	37/2(+)	D	DCO=0.56 *15*.
221.7 *3*	1.5 *9*	5594.9	39/2(+)	5373.1	35/2,39/2		
229.7 *2*	75‡	229.67	7/2+	0.0	5/2+	[M1]	
233.7 *2*	16.1 *16*	3229.9	27/2(+)	2996.2	23/2(+)	Q	DCO=0.84 *15*.
241.9 *3*	3.5 *6*	4881.1	35/2	4639.4	33/2(−)	D	DCO=0.39 *15*.
250.3 *2*	6.0 *12*	4862.3	35/2	4612.1	33/2(+)	D	DCO=0.57 *13*.
261.7 *2*	12.6 *9*	5594.9	39/2(+)	5333.5	37/2(+)	D	DCO=0.66 *14*.
268.8 *3*	2.6 *6*	5176.2	35/2,39/2	4907.5	35/2	D,Q	DCO=0.86 *21*.
271.7 *2*	33.1 *23*	3794.9	31/2(+)	3523.4	29/2(+)	D	DCO=0.54 *7*.

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^{124}Sn(^{28}Si,p4nγ) 2001Po18 (continued)

γ(^{147}Eu) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
281.4 *3*	2.0 *6*	5082.6	$37/2^{(+)}$	4801.2	$33/2^{(+)}$		
290.3 *3*	2.5 *7*	3190.6	$25/2^{(-)}$	2900.4	$27/2^{(-)}$	D	DCO=0.46 *15*.
293.7 *2*	26 *3*	3523.4	$29/2^{(+)}$	3229.9	$27/2^{(+)}$	D	DCO=0.50 *6*.
295.4 *2*	8.8 *8*	4907.5	35/2	4612.1	$33/2^{(+)}$	D	DCO=0.45 *8*.
312.4 *3*	1.4 *8*	5685.5		5373.1	35/2,39/2		
324.3 *3*	2.4 *10*	5381.0	$37/2^{(+)}$	5056.5	$35/2^{(+)}$	D	DCO=0.52 *13*.
328.1 *2*	11.1 *19*	4612.1	$33/2^{(+)}$	4283.9	$31/2^{(-)}$	D	DCO=0.54 *7*.
329.6 *2*	17.8 *21*	3229.9	$27/2^{(+)}$	2900.4	$27/2^{(-)}$	D	DCO=0.96 *12*.
337.4 *3*	2.8 *8*	6847.4	45/2	6510.0	43/2	D	DCO=0.55 *13*.
339.0 *3*	1.1 *6*	6024.5		5685.5			
345.6 *3*	1.4 *7*	3190.6	$25/2^{(-)}$	2845.0	$23/2^{(-)}$		
366.4 *2*	94 *5*	2292.9	$23/2^{(-)}$	1926.5	$19/2^{(-)}$	Q	DCO=0.97 *6*.
369.7 *2*	6.0 *9*	4612.1	$33/2^{(+)}$	4242.4	$31/2^{(-)}$	D	DCO=0.51 *6*.
382.9 *2*	27.3 *24*	4177.8	$33/2^{(+)}$	3794.9	$31/2^{(+)}$	D	DCO=0.43 *5*.
395.7 *2*	77[‡]	625.33	$11/2^-$	229.67	$7/2^+$	[M2]	
420.9 *3*	4.4 *4*	2347.5	$21/2^{(-)}$	1926.5	$19/2^{(-)}$	D	DCO=0.42 *8*.
426.6 *3*	2.8 *5*	5333.5	$37/2^{(+)}$	4907.5	35/2	D	DCO=0.43 *11*.
438.1 *2*	7.5 *7*	5771.6	$41/2^{(+)}$	5333.5	$37/2^{(+)}$	Q	DCO=0.95 *11*.
447.7 *3*	1.2 *3*	4242.4	$31/2^{(-)}$	3794.9	$31/2^{(+)}$	D	DCO=0.83 *20*.
456.1 *3*	2.2 *9*	6966.1	$45/2^{(-)}$	6510.0	43/2	D	DCO=0.41 *20*.
465.5 *3*	3.1 *4*	5373.1	35/2,39/2	4907.5	35/2	D,Q	DCO=0.83 *16*.
470.5 *3*	4.3 *5*	5082.6	$37/2^{(+)}$	4612.1	$33/2^{(+)}$	Q	DCO=0.87 *16*.
491.8 *3*	1.4 *5*	2996.2	$23/2^{(+)}$	2504.5	$19/2^{(+)}$		
492.2 *3*	2.0 *9*	9268.9		8776.7	$53/2^{(-)}$		
497.5 *3*	1.7 *8*	2845.0	$23/2^{(-)}$	2347.5	$21/2^{(-)}$	D	DCO=0.39 *19*.
499.4 *3*	2.1 *9*	4677.6	(35/2)	4177.8	$33/2^{(+)}$	(D)	DCO=0.69 *25*.
512.3 *2*	10 *3*	5594.9	$39/2^{(+)}$	5082.6	$37/2^{(+)}$	D+Q	DCO=0.74 *8*.
513.3 *2*	6.2 *13*	7681.7	$49/2^{(-)}$	7168.4	$47/2^{(-)}$	D	DCO=0.53 *9*.
548.4 *3*	3.4 *5*	5455.8	37/2	4907.5	35/2	D	DCO=0.60 *11*.
561.8 *2*	12.8 *14*	6333.4	$43/2^{(+)}$	5771.6	$41/2^{(+)}$	D+Q	DCO=0.72 *8*.
565.1 *2*	8.5 *9*	3794.9	$31/2^{(+)}$	3229.9	$27/2^{(+)}$	Q	DCO=1.02 *12*.
578.0 *3*	1.1 *9*	2504.5	$19/2^{(+)}$	1926.5	$19/2^{(-)}$		
580.2 *2*	100	1926.5	$19/2^{(-)}$	1346.3	$15/2^-$	Q	DCO=0.97 *6*.
593.5 *3*	2.2 *13*	5455.8	37/2	4862.3	35/2	D	DCO=0.66 *21*.
607.5 *2*	66 *4*	2900.4	$27/2^{(-)}$	2292.9	$23/2^{(-)}$	Q	DCO=1.02 *7*.
622.8 *2*	21.5 *17*	3523.4	$29/2^{(+)}$	2900.4	$27/2^{(-)}$	D	DCO=0.47 *5*.
625.3 *2*	10[‡]	625.33	$11/2^-$	0.0	$5/2^+$	[E3]	
632.8 *3*	3.3 *6*	6966.1	$45/2^{(-)}$	6333.4	$43/2^{(+)}$	D	DCO=0.54 *10*.
648.7 *2*	9.4 *8*	2996.2	$23/2^{(+)}$	2347.5	$21/2^{(-)}$	D	DCO=0.51 *6*.
654.4 *3*	3.7 *5*	4177.8	$33/2^{(+)}$	3523.4	$29/2^{(+)}$	Q	DCO=0.93 *19*.
657	1.4 *6*	5333.5	$37/2^{(+)}$	4677.6	(35/2)		
703.3 *2*	8.8 *6*	2996.2	$23/2^{(+)}$	2292.9	$23/2^{(-)}$	D	DCO=0.84 *12*.
721.0 *2*	100[‡]	1346.3	$15/2^-$	625.33	$11/2^-$	[E2]	
730.2 *3*	1.3 *6*	4907.5	35/2	4177.8	$33/2^{(+)}$	D	DCO=0.32 *16*.
738.3 *2*	7.0 *6*	6510.0	43/2	5771.6	$41/2^{(+)}$	D	DCO=0.47 *8*.
754.0 *3*	1.5 *9*	5432.0		4677.6	(35/2)		
757	0.7 *5*	9268.9		8512.0			
830.3 *3*	1.6 *8*	8512.0		7681.7	$49/2^{(-)}$		
844.6 *3*	3.3 *11*	4639.4	$33/2^{(-)}$	3794.9	$31/2^{(+)}$		
866.5 *3*	1.3 *6*	9643.2		8776.7	$53/2^{(-)}$		
892.3 *3*	3.2 *5*	6663.9	43/2	5771.6	$41/2^{(+)}$	D	DCO=0.52 *13*.

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^{124}Sn(^{28}Si,p4nγ) 2001Po18 (continued)

γ(^{147}Eu) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
931.4 *3*	2.3 *8*	8612.9	$51/2^{(-)}$	7681.7	$49/2^{(-)}$	D	DCO=0.57 *13*.
941.5 *3*	3.4 *5*	6713.1	43/2	5771.6	$41/2^{(+)}$	D	DCO=0.42 *12*.
1045.5 *3*	2.7 *12*	8727.2		7681.7	$49/2^{(-)}$		
1086.2 *3*	1.6 *9*	7419.6		6333.4	$43/2^{(+)}$		
1094.7 *3*	3.5 *16*	8776.7	$53/2^{(-)}$	7681.7	$49/2^{(-)}$	Q	DCO=1.19 *23*.
1155.6 *2*	15.9 *12*	5333.5	$37/2^{(+)}$	4177.8	$33/2^{(+)}$	Q	DCO=0.94 *9*.
1191.2 *3*	2.9 *5*	6962.8	$45/2^{(+)}$	5771.6	$41/2^{(+)}$	(Q)	DCO=0.84 *27*.
1203.2 *2*	7.6 *6*	5381.0	$37/2^{(+)}$	4177.8	$33/2^{(+)}$	Q	DCO=0.86 *16*.
1261.4 *3*	2.5 *9*	5056.5	$35/2^{(+)}$	3794.9	$31/2^{(+)}$	Q	DCO=1.29 *35*.
1277.9 *3*	2.5 *4*	4801.2	$33/2^{(+)}$	3523.4	$29/2^{(+)}$	Q	DCO=1.14 *31*.
1341.8 *2*	6.3 *5*	4242.4	$31/2^{(-)}$	2900.4	$27/2^{(-)}$	Q	DCO=0.99 *15*.
1383.5 *2*	11.2 *9*	4283.9	$31/2^{(-)}$	2900.4	$27/2^{(-)}$	Q	DCO=0.86 *14*.

[†] Based on DCO ratios (2001Po18).
[‡] From 2001Po18 (implied from level scheme from 1992De38).

^{124}Sn(^{28}Si,p4nγ) 2001Po18

Level Scheme

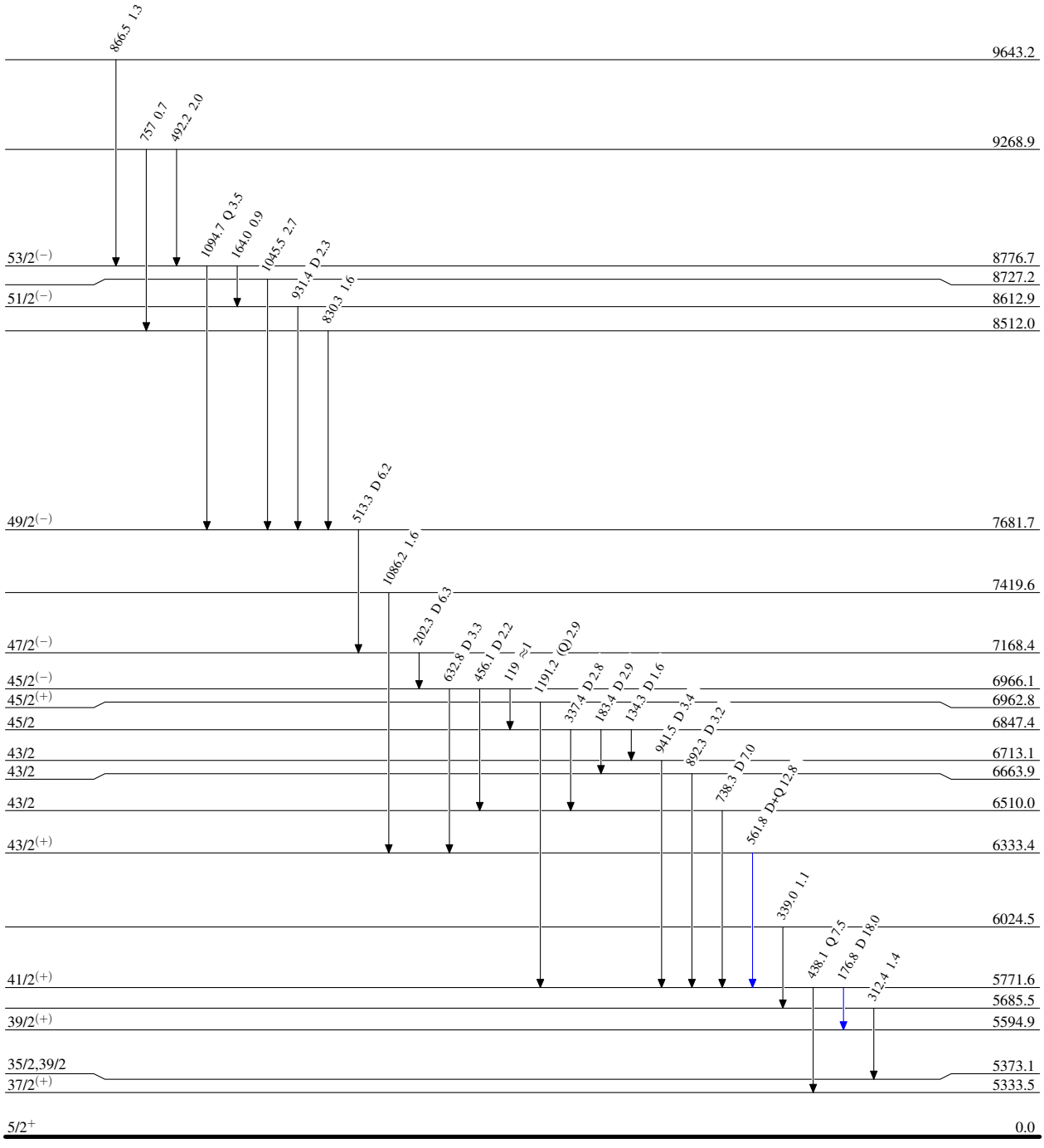
Intensities: Relative I_γ

Legend

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

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

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



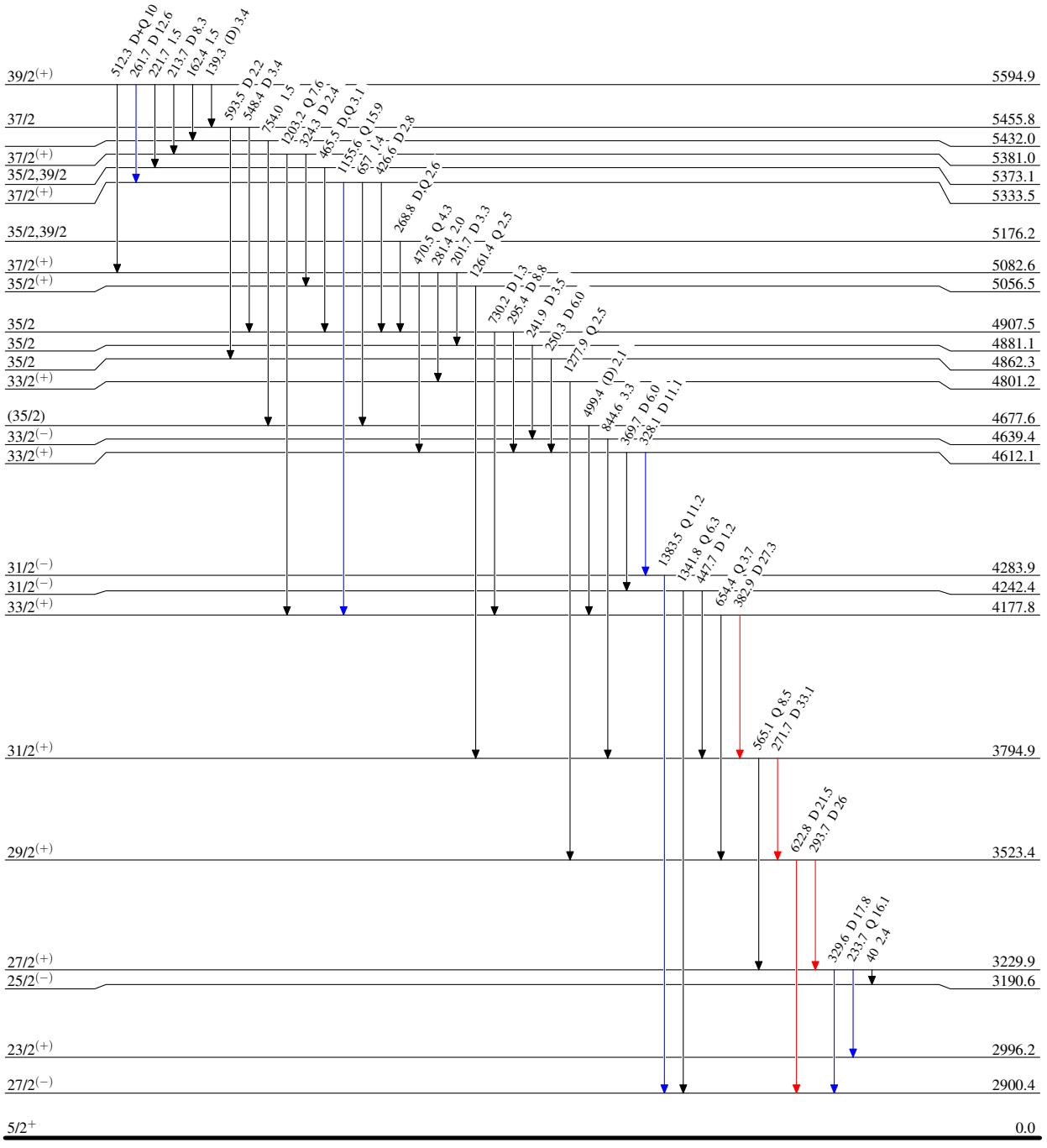
$^{147}_{63}Eu_{84}$

^{124}Sn(^{28}Si,p4nγ) 2001Po18

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)

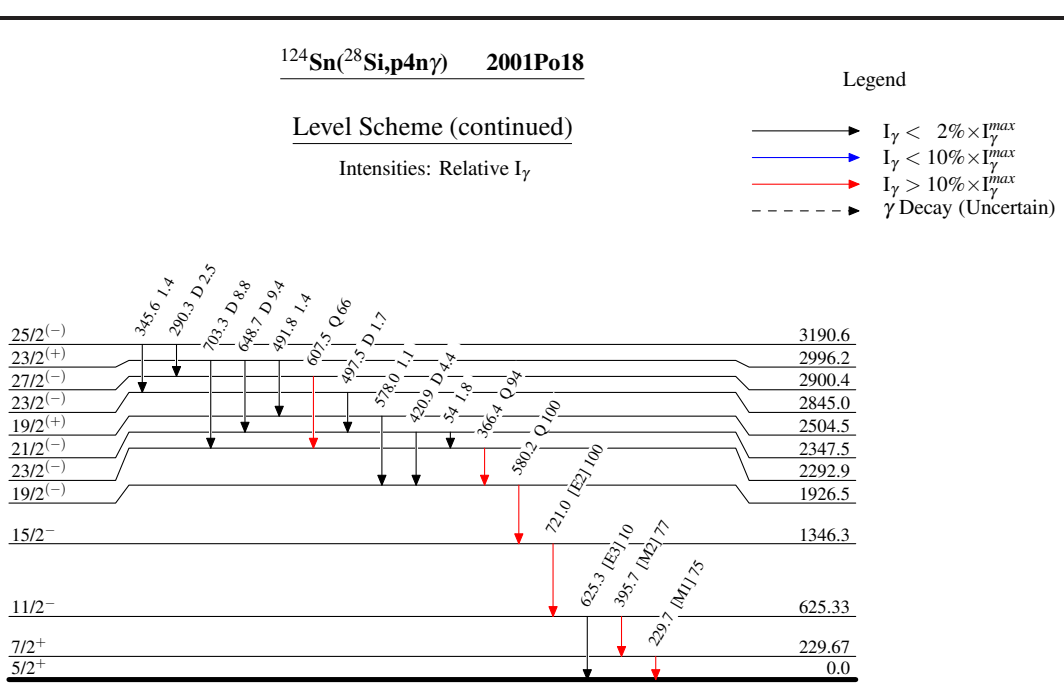


$^{147}_{63}Eu_{84}$

^{124}Sn(^{28}Si,p4nγ) 2001Po18

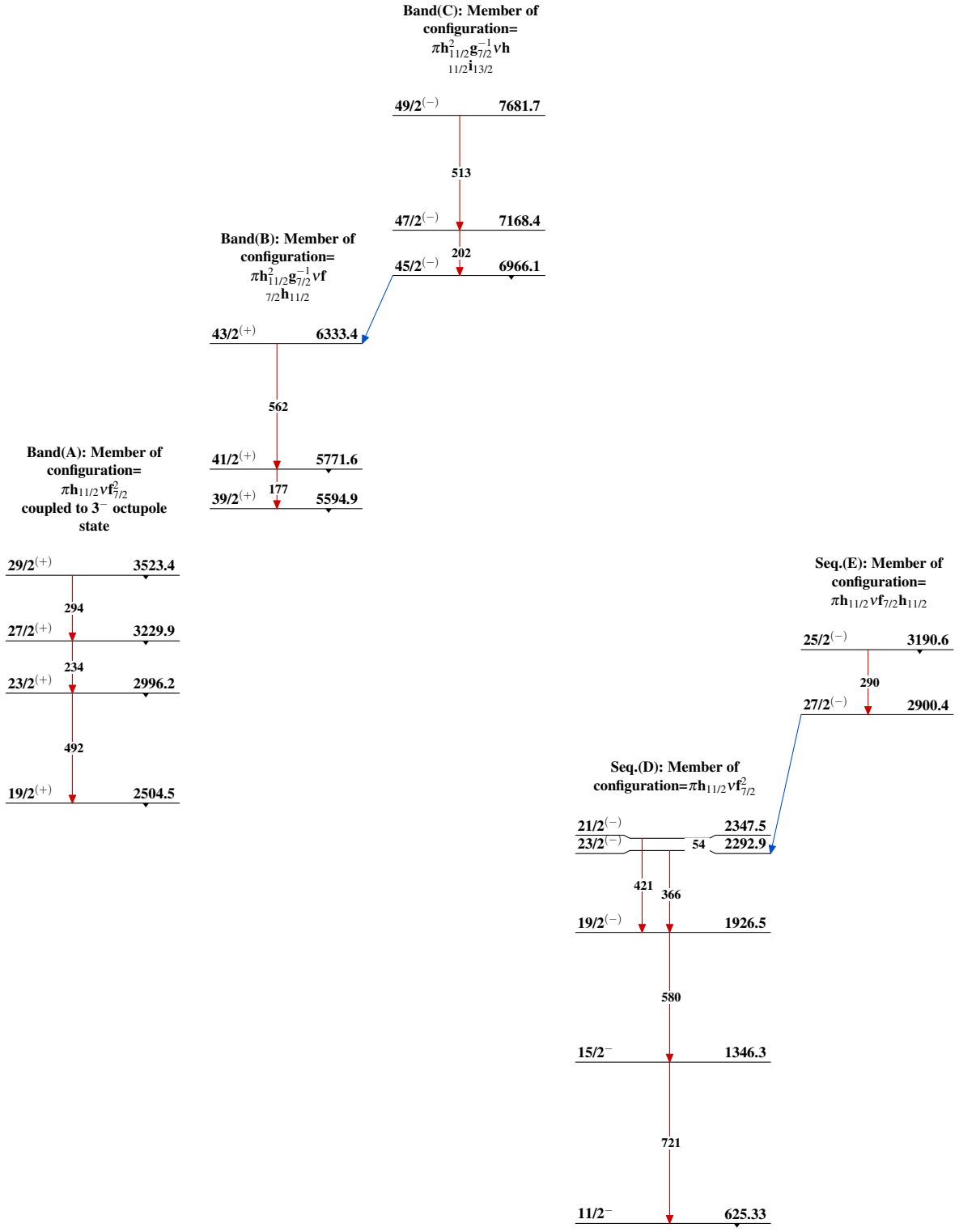
Level Scheme (continued)

Intensities: Relative I_γ



$^{147}_{63}Eu_{84}$

^{124}Sn(^{28}Si,p4nγ) 2001Po18



$^{147}_{63}Eu_{84}$