

¹²²Sn(¹⁸O,5n γ) **1990Ma26**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Alexander A. Rodionov And Yuri L. Khazov		NDS 109, 517 (2008)	22-Jan-2008

1990Ma26: ¹²²Sn(¹⁸O,5n γ) E=85, 89 MeV. Measured E γ , I γ , $\gamma\gamma$ using an array of six BGO suppressed Ge detectors and 14 BGO detectors for multiplicity filter. $\gamma(\theta)$ and $\gamma\gamma(\theta)$ (DCO) were measured using ¹²⁴Sn(¹⁶O,5n γ) E=91 MeV. All band assignments are from **1990Ma26**.

¹³⁵Ce Levels

E(level)	J π [†]	E(level)	J π [†]	E(level)	J π [†]	E(level)	J π [†]
0.0	1/2 ⁽⁺⁾	2947.9 6	(23/2 ⁻)	4259.4 [@] 8	(31/2 ⁺)	5651.3 ^{&} 9	(35/2 ⁻)
82.67 [‡] 5	3/2 ⁽⁺⁾ [‡]	3054.0 6	(21/2 ⁺)	4400.1 ^c 8	(31/2 ⁻)	5751.8 ^b 9	(37/2 ⁻)
296.09 [‡] 5	(5/2 ⁺) [‡]	3076.2 [#] 6	(21/2 ⁺)	4460.5 ^{&} 7	(29/2 ⁻)	5941.7 [#] 12	(37/2 ⁺)
445.8 ^{‡a} 2	(11/2 ⁻) [‡]	3104.1 ^a 6	(23/2 ⁻)	4485.7 [#] 9	(31/2 ⁺)	6086.2 ^{&} 9	(37/2 ⁻)
1035.7 ^a 4	(13/2 ⁻)	3229.0 [#] 6	(23/2 ⁺)	4495.8 ^b 7	(27/2 ⁻)	6256.4 ^b 10	(39/2 ⁻)
1145.3 ^a 4	(15/2 ⁻)	3431.1 [#] 7	(25/2 ⁺)	4634.8 ^b 6	(29/2 ⁻)	6299.3 [@] 13	(39/2 ⁺)
1670.0 5	(15/2 ⁻)	3505.4 6	(25/2 ⁻)	4813.1 ^b 7	(31/2 ⁻)	6443.7 [#] 13	(39/2 ⁺)
1869.4 ^a 5	(17/2 ⁻)	3514.5 [@] 7	(27/2 ⁺)	4830.5 ^{&} 8	(31/2 ⁻)	6477.1 ^c 17	(39/2 ⁻)
2051.6 ^a 5	(19/2 ⁻)	3699.0 [#] 8	(27/2 ⁺)	4978.6 [#] 10	(33/2 ⁺)	6526.2 ^{&} 10	(39/2 ⁻)
2125.3 [@] 6	(19/2 ⁺)	3701.8 ^c 7	(27/2 ⁻)	5062.1 ^b 7	(33/2 ⁻)	6840.0 ^b 11	(41/2 ⁻)
2248.9 5	(19/2 ⁻)	3771.5? 6	(27/2 ⁺)	5206.2 ^{&} 8	(33/2 ⁻)	6994.2 ^{&} 10	(41/2 ⁻)
2550.9 [@] 6	(23/2 ⁺)	4032.4 7	(25/2 ⁻)	5324.3 [@] 9	(35/2 ⁺)	7470.0 ^b 15	(43/2 ⁻)
2682.2 6	(21/2 ⁻)	4065.6 ^{&} 7	(25/2 ⁻)	5342.1 ^c 13	(35/2 ⁻)	7494.2 ^{&} 12	(43/2 ⁻)
2887.5 ^a 7	(21/2 ⁻)	4127.4 [#] 9	(29/2 ⁺)	5359.6 ^b 8	(35/2 ⁻)	8011.2? ^{&} 16	(45/2 ⁻)
2946.1 [#] 6	(19/2 ⁺)	4183.2 ^{&} 6	(27/2 ⁻)	5427.7 [#] 10	(35/2 ⁺)	8034.0? ^b 18	(45/2 ⁻)

[†] From $\gamma\gamma(\theta)$ (DCO) and/or $\gamma(\theta)$ data and band structures.

[‡] From Adopted Levels.

[#] Band(A): $\nu h_{11/2} \otimes (\pi h_{11/2})(\pi g_{7/2})$. Proton aligned band, $\gamma \approx 0^\circ$.

[@] Band(B): $\nu s_{1/2} \otimes \nu h_{11/2}^2$. Neutron aligned band, $\gamma \approx -60^\circ$.

[&] Band(C): $\nu h_{11/2} \otimes \pi h_{11/2}^2$. Proton aligned band, $\gamma \approx 0^\circ$.

^a Band(D): triaxial band. Configuration= $\nu h_{11/2}$, $\gamma \approx -30^\circ$.

^b Band(E): Four-quasiparticle band. Configuration= $\nu[(s_{1/2})(h_{11/2}^2)] \otimes \pi[(h_{11/2})(g_{7/2})]$. Oblate band, $\gamma \approx -60^\circ$.

^c Band(F): $\nu h_{11/2} \otimes \nu h_{11/2}^2$. Neutron aligned band, $\gamma \approx -60^\circ$.

$\gamma(^{135}\text{Ce})$

DCO's correspond to gates on $\Delta J=2$, quadrupole transitions.

E γ	I γ [‡]	E _i (level)	J π _i	E _f	J π _f	Mult. [†]	I _($\gamma+ce$)	Comments
82.64 [#] 7		82.67	3/2 ⁽⁺⁾	0.0	1/2 ⁽⁺⁾			
108.0 4	<1	3054.0	(21/2 ⁺)	2946.1	(19/2 ⁺)	D ^{&}	<2	R(DCO)=0.3 1.
109.5 4	<0.5	1145.3	(15/2 ⁻)	1035.7	(13/2 ⁻)		<1	
117.9 4	3 1	4183.2	(27/2 ⁻)	4065.6	(25/2 ⁻)	D ^{&}	5 1	R(DCO)=0.60 5.
129.8 4	<1.3	3076.2	(21/2 ⁺)	2946.1	(19/2 ⁺)		<2	
139.1 4	<1.4	4634.8	(29/2 ⁻)	4495.8	(27/2 ⁻)	D ^{&}	<2	R(DCO)=0.35 5.
149.7 [#] 2		445.8	(11/2 ⁻)	296.09	(5/2 ⁺)			

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¹²²Sn(¹⁸O,5n γ) 1990Ma26 (continued)

γ (¹³⁵Ce) (continued)

E_γ	I_γ^\ddagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	δ^\dagger	$I_{(\gamma+ce)}$	Comments
150.7 4	7 1	4183.2	(27/2 ⁻)	4032.4	(25/2 ⁻)	D&		9 1	R(DCO)=0.77 5.
152.7 4	<1.5	3229.0	(23/2 ⁺)	3076.2	(21/2 ⁺)	D&		<2	R(DCO)=0.5 1.
175.1 4	8 1	3229.0	(23/2 ⁺)	3054.0	(21/2 ⁺)	D(+Q)&	+0.05 8	10 1	A ₂ =-0.16 4, A ₄ =+0.11 6. R(DCO)=0.8 1.
178.5 4	9 1	4813.1	(31/2 ⁻)	4634.8	(29/2 ⁻)	D(+Q)&	+0.06 7	11 1	A ₂ =-0.14 4, A ₄ =+0.09 5. R(DCO)=0.6 1.
181.9 4	<1.6	2051.6	(19/2 ⁻)	1869.4	(17/2 ⁻)			<2	
202.1 4	23 3	3431.1	(25/2 ⁺)	3229.0	(23/2 ⁺)	D(+Q)&	+0.07 7	27 3	Doublet with a contaminant peak. A ₂ =-0.13 3, A ₄ =+0.10 5. R(DCO)=0.43 3.
213.45 [#] 6		296.09	(5/2 ⁺)	82.67	3/2 ⁽⁺⁾				
216 1	<0.9	3104.1	(23/2 ⁻)	2887.5	(21/2 ⁻)			<1	
249.0 4	9 1	5062.1	(33/2 ⁻)	4813.1	(31/2 ⁻)	D(+Q)&	-0.02 +4-6	10 1	A ₂ =-0.26 4, A ₄ =+0.07 6. R(DCO)=0.31 5.
256.0 4	69 7	2125.3	(19/2 ⁺)	1869.4	(17/2 ⁻)	D&		70 7	A ₂ =-0.09 3, A ₄ =+0.08 4.
257 ^a 1	<2	3771.5?	(27/2 ⁺)	3514.5	(27/2 ⁺)			<2	
265.7 4	8 1	2947.9	(23/2 ⁻)	2682.2	(21/2 ⁻)	D&		9 1	R(DCO)=0.84 3.
268.0 4	15 2	3699.0	(27/2 ⁺)	3431.1	(25/2 ⁺)	D+Q&	-0.07 2	16 2	A ₂ =-0.36 4, A ₄ =+0.03 5. R(DCO)=0.49 3.
277.1 4	14 2	4460.5	(29/2 ⁻)	4183.2	(27/2 ⁻)	D(+Q)&	-0.03 5	15 2	A ₂ =-0.28 4, A ₄ =+0.07 5. R(DCO)=0.36 3.
296.12 [#] 5		296.09	(5/2 ⁺)	0.0	1/2 ⁽⁺⁾				
297.5 4	9 1	5359.6	(35/2 ⁻)	5062.1	(33/2 ⁻)	D&		10 1	Doublet with a contaminant peak. R(DCO)=0.59 3.
352.4 4	2 1	4813.1	(31/2 ⁻)	4460.5	(29/2 ⁻)	D&		2 1	R(DCO)=0.4 1.
358.2 4	10 1	4485.7	(31/2 ⁺)	4127.4	(29/2 ⁺)	D(+Q)&	-0.06 7	10 1	A ₂ =-0.33 5, A ₄ =+0.11 7. R(DCO)=0.87 5.
370.0 4	6 1	4830.5	(31/2 ⁻)	4460.5	(29/2 ⁻)	D+Q&	-0.10 6	6 1	A ₂ =-0.41 6, A ₄ =+0.08 8. R(DCO)=0.60 4.
375.6 4	4 1	5206.2	(33/2 ⁻)	4830.5	(31/2 ⁻)	D&		4 1	R(DCO)=0.63 5.
379.2 4	6 1	2248.9	(19/2 ⁻)	1869.4	(17/2 ⁻)	D&		6 1	R(DCO)=0.58 5.
392.2 4	10 1	5751.8	(37/2 ⁻)	5359.6	(35/2 ⁻)	D(+Q)&	-0.04 6	10 1	A ₂ =-0.29 5, A ₄ =+0.08 7. R(DCO)=0.51 4.
425.6 4	46 5	2550.9	(23/2 ⁺)	2125.3	(19/2 ⁺)	(Q) [@]		47 5	A ₂ =+0.44 4, A ₄ =+0.01 5.
428.3 4	11 1	4127.4	(29/2 ⁺)	3699.0	(27/2 ⁺)	D+Q&	-0.11 3	11 1	A ₂ =-0.43 4, A ₄ =+0.03 6. R(DCO)=0.61 6.
433.5 4	11 1	2682.2	(21/2 ⁻)	2248.9	(19/2 ⁻)	D+Q&	-0.16 4	11 1	A ₂ =-0.51 4, A ₄ =+0.07 6. R(DCO)=0.2 1.
434.9 4	11 1	6086.2	(37/2 ⁻)	5651.3	(35/2 ⁻)	D+Q&	-0.18 5	11 1	A ₂ =-0.52 4, A ₄ =+0.07 6. R(DCO)=0.3 1.
440.0 4	6 1	6526.2	(39/2 ⁻)	6086.2	(37/2 ⁻)	D+Q&	-0.19 +8-11	6 1	A ₂ =-0.55 6, A ₄ =+0.11 8. R(DCO)=0.27 6.
445.1 4	13 1	5651.3	(35/2 ⁻)	5206.2	(33/2 ⁻)	D+Q&	-0.23 3	13 1	Doublet with a contaminant peak. A ₂ =-0.61 4, A ₄ =+0.03 6. R(DCO)=0.32 4.
449.2 4	5 1	5427.7	(35/2 ⁺)	4978.6	(33/2 ⁺)	D&		5 1	R(DCO)=0.4 1.
468.0 4	3 1	6994.2	(41/2 ⁻)	6526.2	(39/2 ⁻)	D&		3 1	R(DCO)=0.5 1.

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$^{122}\text{Sn}(^{18}\text{O},5n\gamma)$ 1990Ma26 (continued) $\gamma(^{135}\text{Ce})$ (continued)

E_γ	I_γ [‡]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	δ^\dagger	$I_{(\gamma+ce)}$	Comments
492.9 4	7 1	4978.6	(33/2 ⁺)	4485.7	(31/2 ⁺)	D&		7 1	R(DCO)=0.6 1.
500 1	<2	7494.2	(43/2 ⁻)	6994.2	(41/2 ⁻)	D&		<2	R(DCO)=0.7 1.
502 1	<2	6443.7	(39/2 ⁺)	5941.7	(37/2 ⁺)			<2	
503.1 4	4 1	3054.0	(21/2 ⁺)	2550.9	(23/2 ⁺)			4 1	R(DCO)=1.0 1 consistent with $\Delta J=1$ or 2. 1990Ma26 assign $\Delta J=1$.
504.6 4	6 1	6256.4	(39/2 ⁻)	5751.8	(37/2 ⁻)	D&		6 1	R(DCO)=0.5 1.
514 1	<2	5941.7	(37/2 ⁺)	5427.7	(35/2 ⁺)			<2	
517 ^a 1	<2	8011.2?	(45/2 ⁻)	7494.2	(43/2 ⁻)			<2	
525 1	<2	1670.0	(15/2 ⁻)	1145.3	(15/2 ⁻)	D&		<2	R(DCO)=0.3 1.
525.2 4	3 1	3076.2	(21/2 ⁺)	2550.9	(23/2 ⁺)	D&		3 1	R(DCO)=0.7 1.
557.3 4	3 1	3505.4	(25/2 ⁻)	2947.9	(23/2 ⁻)	D&		3 1	R(DCO)=0.55 5.
564 ^a 1	<2	8034.0?	(45/2 ⁻)	7470.0	(43/2 ⁻)			<2	
579.5 4	16 2	2248.9	(19/2 ⁻)	1670.0	(15/2 ⁻)	Q@		16 2	$A_2=+0.31$ 5, $A_4=-0.01$ 6. R(DCO)=1.5 1.
583.6 4	4 1	6840.0	(41/2 ⁻)	6256.4	(39/2 ⁻)			4 1	
589.7 4	54 6	1035.7	(13/2 ⁻)	445.8	(11/2 ⁻)	D+Q&	-0.42 +6-10	55 6	$A_2=-0.86$ 3, $A_4=+0.09$ 5. R(DCO)=0.34 3.
630 1	3 1	7470.0	(43/2 ⁻)	6840.0	(41/2 ⁻)			3 1	
634.9 4	24 2	1670.0	(15/2 ⁻)	1035.7	(13/2 ⁻)	D(+Q)&	-0.02 5	24 2	Doublet with a contaminant peak. $A_2=-0.22$ 4, $A_4=+0.07$ 5. R(DCO)=0.3 1.
678 1	3 1	3229.0	(23/2 ⁺)	2550.9	(23/2 ⁺)			3 1	R(DCO)=0.9 1 is consistent with $\Delta J=1$ or 2 and also with $\Delta J=0$, dipole. 1990Ma26 assign $\Delta J=0$, dipole.
696 1	<2	4127.4	(29/2 ⁺)	3431.1	(25/2 ⁺)			<2	
698.3 4	3 1	4400.1	(31/2 ⁻)	3701.8	(27/2 ⁻)	Q@		3 1	R(DCO)=1.3 1.
699.6 4	100	1145.3	(15/2 ⁻)	445.8	(11/2 ⁻)			100	$A_2=+0.36$ 4, $A_4=-0.01$ 4.
724.3 4	19 2	1869.4	(17/2 ⁻)	1145.3	(15/2 ⁻)	D+Q&	-0.25 9	19 2	$A_2=-0.70$ 3, $A_4=+0.01$ 5. R(DCO)=0.39 5.
745.0 4	13 1	4259.4	(31/2 ⁺)	3514.5	(27/2 ⁺)	Q@		13 1	$A_2=+0.41$ 5, $A_4=-0.02$ 6. R(DCO)=1.31 4.
746 1	<2	5206.2	(33/2 ⁻)	4460.5	(29/2 ⁻)			<2	
753.8 4	8 1	3701.8	(27/2 ⁻)	2947.9	(23/2 ⁻)	Q@		8 1	R(DCO)=1.5 1.
786.8 4	2 1	4485.7	(31/2 ⁺)	3699.0	(27/2 ⁺)			2 1	
803 ^a 1	<2	5062.1	(33/2 ⁻)	4259.4	(31/2 ⁺)			<2	
821 1	<2	5651.3	(35/2 ⁻)	4830.5	(31/2 ⁻)	Q@		<2	R(DCO)=1.1 1.
823.5 4	3 1	3505.4	(25/2 ⁻)	2682.2	(21/2 ⁻)	Q@		3 1	R(DCO)=1.4 1.
833.1 4	35 4	1869.4	(17/2 ⁻)	1035.7	(13/2 ⁻)	(Q)@		35 4	$A_2=+0.37$ 4, $A_4=+0.09$ 5.
836 1	5 1	2887.5	(21/2 ⁻)	2051.6	(19/2 ⁻)	D&		5 1	R(DCO)=0.4 1.
851 1	<2	4978.6	(33/2 ⁺)	4127.4	(29/2 ⁺)			<2	
863.2 4	5 1	4634.8	(29/2 ⁻)	3771.5?	(27/2 ⁺)	(D)&		5 1	R(DCO)=0.8 1.
875 ^a 1	<2	6526.2	(39/2 ⁻)	5651.3	(35/2 ⁻)			<2	
880 1	<2	6086.2	(37/2 ⁻)	5206.2	(33/2 ⁻)			<2	R(DCO)=0.9 1 suggests $\Delta J=1$ or 2. 1990Ma26 assign $\Delta J=2$.
896 1	7 1	2947.9	(23/2 ⁻)	2051.6	(19/2 ⁻)			7 1	R(DCO)=0.9 1 is consistent with $\Delta J=1$ or 2. 1990Ma26 assign $\Delta J=2$.
906.2 4	22 2	2051.6	(19/2 ⁻)	1145.3	(15/2 ⁻)	Q@		22 2	$A_2=+0.39$ 4, $A_4=-0.07$ 5. R(DCO)=1.02 3.

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¹²²Sn(¹⁸O,⁵n γ) 1990Ma26 (continued)

$\gamma(^{135}\text{Ce})$ (continued)

E_γ	I_γ^\ddagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	δ^\dagger	$I_{(\gamma+ce)}$	Comments
908 ^a 1	<2	6994.2	(41/2 ⁻)	6086.2	(37/2 ⁻)			<2	
928 ^a 1	<2	4032.4	(25/2 ⁻)	3104.1	(23/2 ⁻)			<2	
928.7 4	4 1	3054.0	(21/2 ⁺)	2125.3	(19/2 ⁺)	D+Q ^{&}	-0.16 8	4 1	A ₂ =-0.51 4, A ₄ =+0.11 6. R(DCO)=0.77 6.
933 1	<2	4634.8	(29/2 ⁻)	3701.8	(27/2 ⁻)	(D) ^{&}		<2	R(DCO)=0.8 1.
942 1	2 1	5342.1	(35/2 ⁻)	4400.1	(31/2 ⁻)	Q [@]		2 1	R(DCO)=1.5 1.
942 1	<2	5427.7	(35/2 ⁺)	4485.7	(31/2 ⁺)			<2	
951.1 4	<2	3076.2	(21/2 ⁺)	2125.3	(19/2 ⁺)			<2	
962 1	2 1	4065.6	(25/2 ⁻)	3104.1	(23/2 ⁻)	D ^{&}		2 1	R(DCO)=0.4 1.
963 1	<2	5941.7	(37/2 ⁺)	4978.6	(33/2 ⁺)			<2	
963.6 4	26 3	3514.5	(27/2 ⁺)	2550.9	(23/2 ⁺)	Q [@]		26 3	A ₂ =+0.36 4, A ₄ =-0.01 5. R(DCO)=1.21 4.
968 1	<2	7494.2	(43/2 ⁻)	6526.2	(39/2 ⁻)			<2	
975 1	<2	6299.3	(39/2 ⁺)	5324.3	(35/2 ⁺)			<2	
991 1	<2	4495.8	(27/2 ⁻)	3505.4	(25/2 ⁻)			<2	
1016 ^a 1	<2	6443.7	(39/2 ⁺)	5427.7	(35/2 ⁺)			<2	
1019 1	5 1	2887.5	(21/2 ⁻)	1869.4	(17/2 ⁻)			5 1	
1052.1 4	15 2	3104.1	(23/2 ⁻)	2051.6	(19/2 ⁻)	(Q) [@]		15 2	A ₂ =+0.23 4, A ₄ =+0.08 5. R(DCO)=1.3 1.
1064.9 4	4 1	5324.3	(35/2 ⁺)	4259.4	(31/2 ⁺)	(Q) [@]		4 1	A ₂ =+0.46 10, A ₄ =+0.06 13.
1076.6 4	<2	2946.1	(19/2 ⁺)	1869.4	(17/2 ⁻)			<2	
1078.6 4	4 1	4183.2	(27/2 ⁻)	3104.1	(23/2 ⁻)			4 1	R(DCO)=0.9 1 suggests $\Delta J=1$ or 2.
1130 1	3 1	4634.8	(29/2 ⁻)	3505.4	(25/2 ⁻)	(Q)		3 1	R(DCO)>1 suggests $\Delta J=2$.
1135 1	<2	6477.1	(39/2 ⁻)	5342.1	(35/2 ⁻)			<2	
1178.3 4	2 1	4065.6	(25/2 ⁻)	2887.5	(21/2 ⁻)	(Q) [@]		2 1	A ₂ =+0.46 19, A ₄ =+0.13 22.
1220.6 4	5 1	3771.5?	(27/2 ⁺)	2550.9	(23/2 ⁺)	Q [@]		5 1	A ₂ =+0.049 10, A ₄ =+0.07 13. R(DCO)=1.5 1.

[†] From $\gamma(\theta)$ and $\gamma\gamma(\theta)$ data.

[‡] Deduced from $I(\gamma+ce)$, assuming E2 for $\Delta J=2$ and M1 for $\Delta J=1$, $\Delta\pi=\text{no}$ transitions.

From adopted gammas.

@ $\gamma\gamma(\theta)$ (DCO) and/or $\gamma(\theta)$ indicate $\Delta J=2$, quadrupole (most likely E2).

& $\gamma\gamma(\theta)$ (DCO) and/or $\gamma(\theta)$ indicate $\Delta J=1$, dipole with possible quadrupole admixture for $\Delta\pi=\text{no}$ transitions.

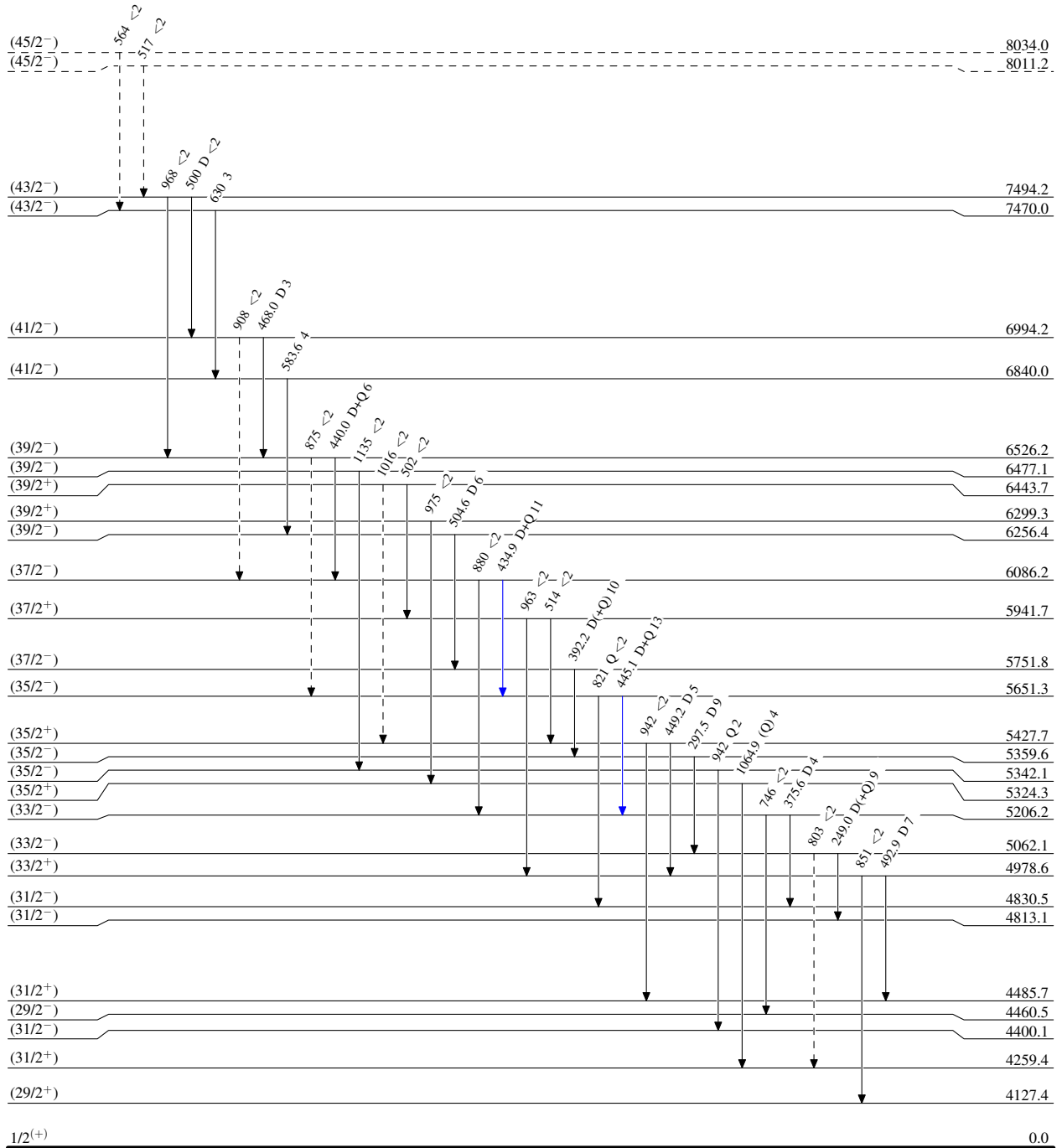
^a Placement of transition in the level scheme is uncertain.

¹²²Sn(¹⁸O,⁵n) γ 1990Ma26

Legend

Level Scheme
Intensities: Relative I γ

- \rightarrow I γ < 2% \times I γ^{max}
- \rightarrow I γ < 10% \times I γ^{max}
- \rightarrow I γ > 10% \times I γ^{max}
- \rightarrow γ Decay (Uncertain)



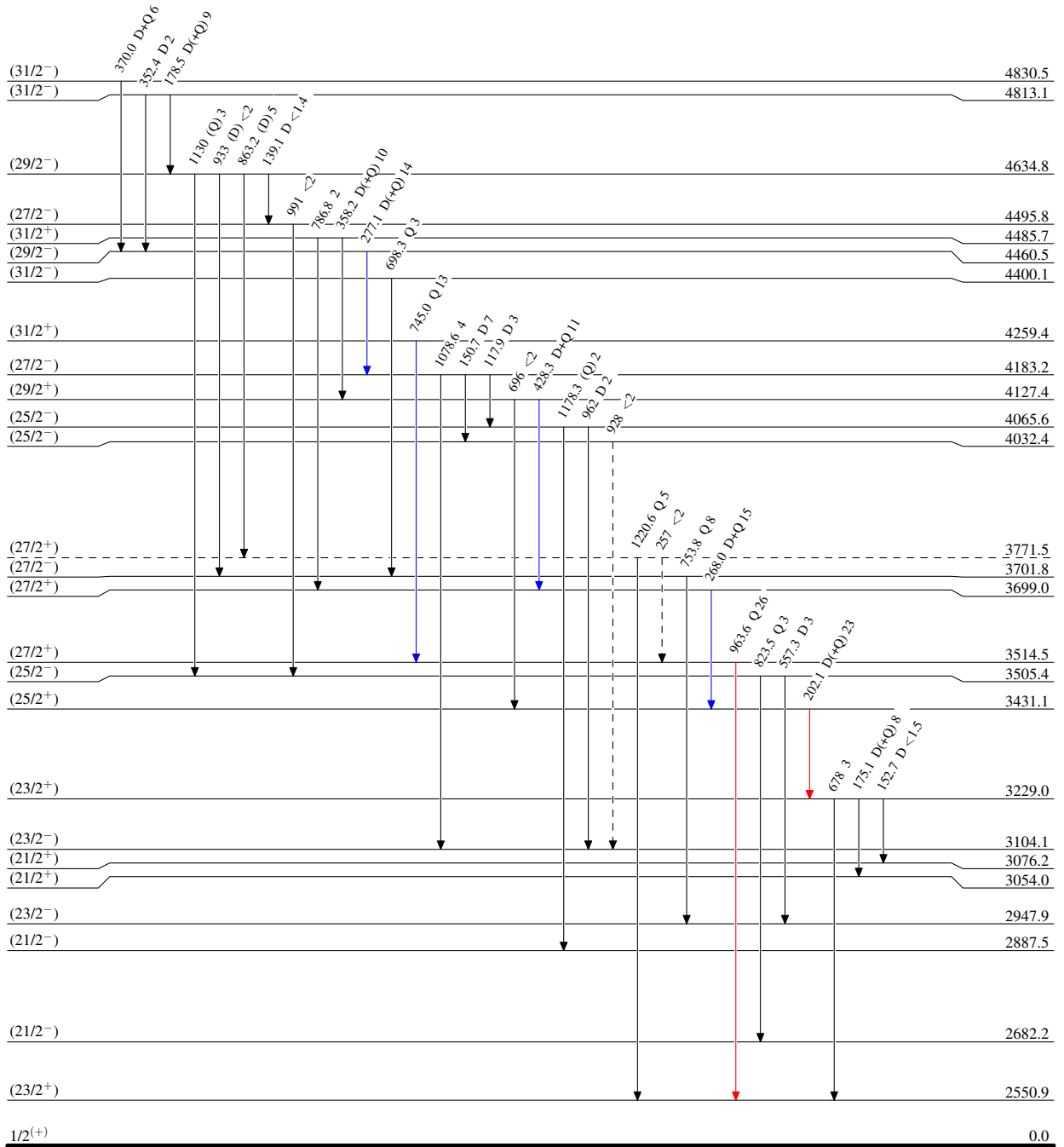
¹²²Sn(18O,5n) γ 1990Ma26

Legend

Level Scheme (continued)

Intensities: Relative I γ

- \longrightarrow I γ < 2% \times I γ^{max}
- \longrightarrow I γ < 10% \times I γ^{max}
- \longrightarrow I γ > 10% \times I γ^{max}
- \dashrightarrow γ Decay (Uncertain)



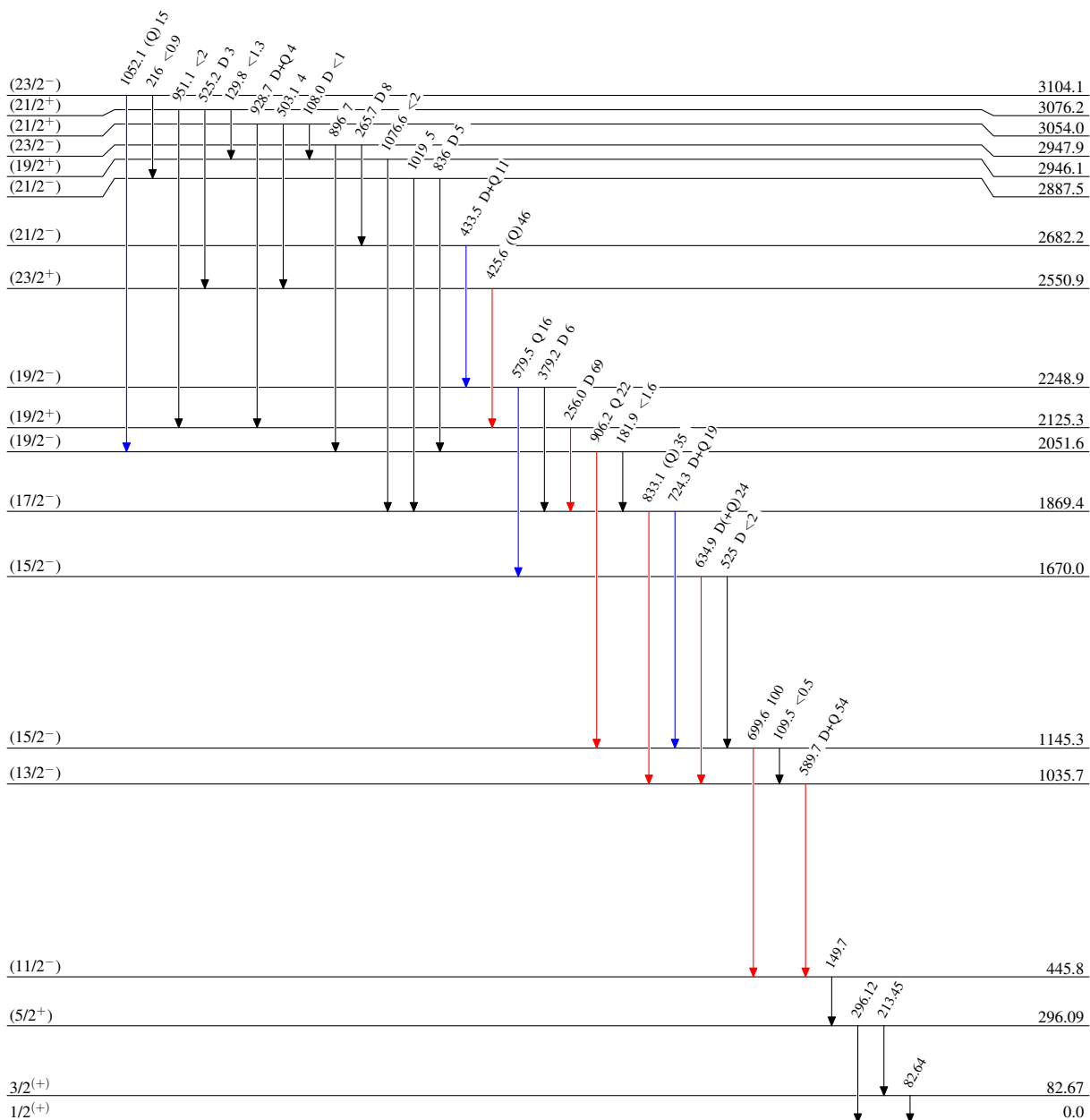
$^{122}\text{Sn}(^{18}\text{O},5n\gamma)$ 1990Ma26

Level Scheme (continued)

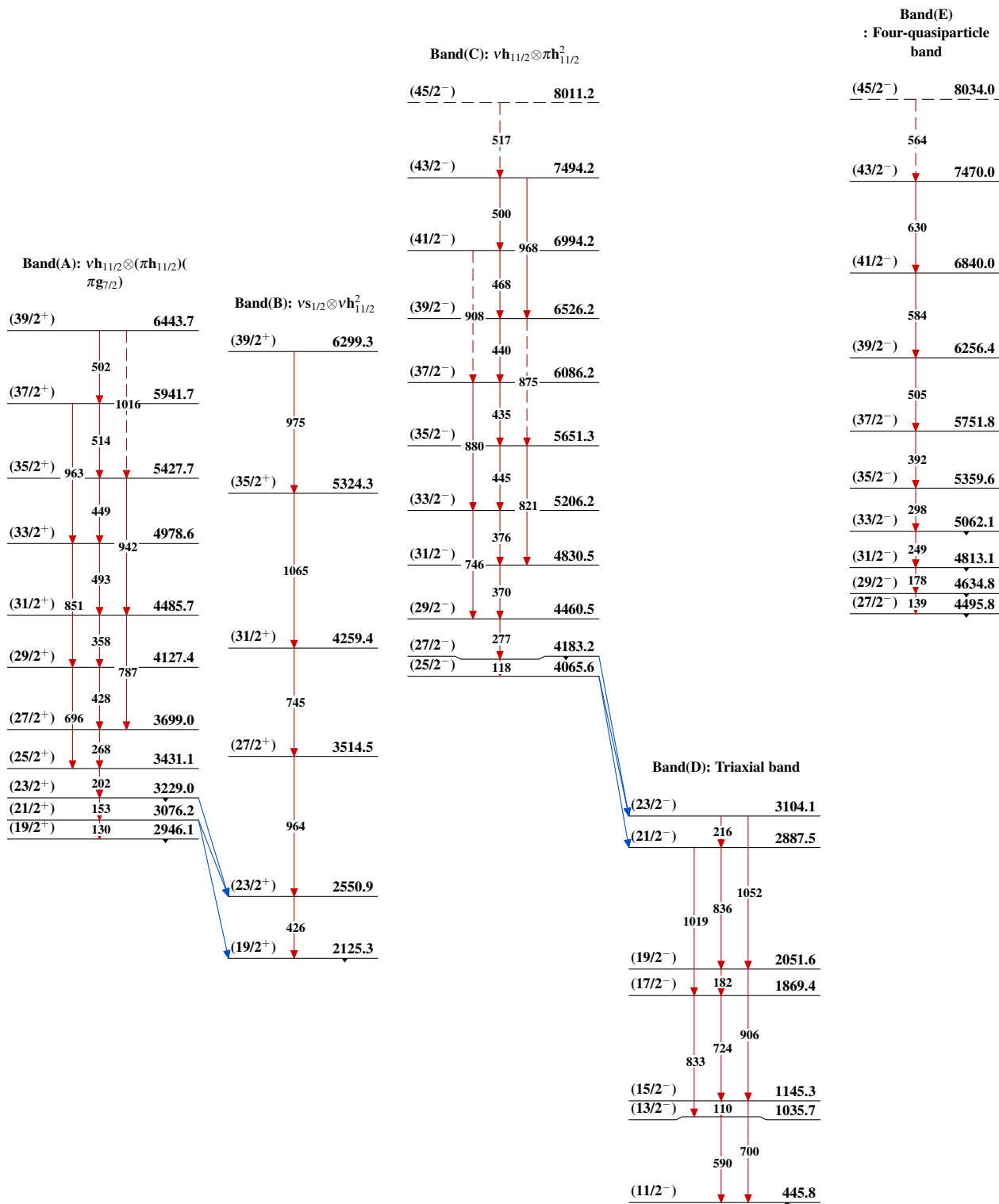
Intensities: Relative I_γ

Legend

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



$^{122}\text{Sn}(^{18}\text{O},5n\gamma)$ 1990Ma26



$^{122}\text{Sn}(^{18}\text{O},5n\gamma)$ 1990Ma26 (continued)Band(F): $\nu h_{11/2} \otimes \nu h_{11/2}^2$ (39/2⁻) 6477.1

1135

(35/2⁻) 5342.1

942

(31/2⁻) 4400.1

698

(27/2⁻) 3701.8 $^{135}_{58}\text{Ce}_{77}$