

$^{124}\text{Sn}(^{29}\text{Si},\text{p5n}\gamma):\text{SD}$ **1998Ha21**

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

1998Ha21: $^{124}\text{Sn}(^{29}\text{Si},\text{p5n}\gamma)$ E=158 MeV. Measured $E\gamma$, $I\gamma$, $\gamma\gamma\gamma$, $\gamma\gamma\gamma\gamma$ -(particle) coincidences, using Gammasphere array of 95 HPGe detectors and microball array of 95 charged-particle detectors. Deduced SD band.

 ^{147}Eu Levels

E(level)	J^π	E(level)	J^π	E(level)	J^π	E(level)	J^π
$x^\dagger$	J	4118.9+y [‡] 8	J1+10	8649.7+z [#] 8	J2+18	4708.5+v ^{&} 9	J4+10
737.3+x [‡] 3	J+2	5123.7+y [‡] 8	J1+12	9921.3+z [#] 8	J2+20	5812.2+v ^{&} 10	J4+12
1527.9+x [‡] 4	J+4	6188.8+y [‡] 8	J1+14	11251.1+z [#] 8	J2+22	6967.6+v ^{&} 11	J4+14
2370.2+x [‡] 4	J+6	7315.2+y [‡] 8	J1+16	12634.4+z [#] 9	J2+24	8190.3+v ^{&} 12	J4+16
3262.5+x [‡] 4	J+8	8502.2+y [‡] 8	J1+18	14055.7+z [#] 10	J2+26	9466.3+v ^{&} 13	J4+18
4209.3+x [‡] 4	J+10	9749.5+y [‡] 8	J1+20	u [@]	J3	10798.1+v ^{&} 13	J4+20
5210.6+x [‡] 4	J+12	11056.8+y [‡] 8	J1+22	944.0+u [@] 3	J3+2	12186.4+v ^{&} 15	J4+22
6266.9+x [‡] 4	J+14	12423.4+y [‡] 9	J1+24	1938.8+u [@] 4	J3+4	13634.0+v ^{&} 15	J4+24
7379.4+x [‡] 4	J+16	13847.2+y [‡] 9	J1+26	2985.0+u [@] 5	J3+6	15140.9+v ^{&} 16	J4+26
8548.8+x [‡] 6	J+18	15321.3+y [‡] 9	J1+28	4081.3+u [@] 5	J3+8	16702.0+v ^{&} 19	J4+28
9775.4+x [‡] 6	J+20	16818.3+y [‡] 14	J1+30	5232.9+u [@] 5	J3+10	18322.2+v ^{&} 24	J4+30
11059.6+x [‡] 6	J+22	18315.3+y [‡] 17	J1+32	6436.3+u [@] 6	J3+12	w ^{?ab}	J5
12402.4+x [‡] 6	J+24	19846.6+y [‡] 18	J1+34	7694.3+u [@] 7	J3+14	1244+w ^a	J5+2
13804.0+x [‡] 7	J+26	21429.3+y [‡] 23	J1+36	9007.7+u [@] 7	J3+16	2541+w ^{?a}	J5+4
15264.5+x [‡] 7	J+28	z [#]	J2	10382.9+u [@] 8	J3+18	3884+w ^{?a}	J5+6
16783.8+x [‡] 8	J+30	708.1+z [#] 3	J2+2	11847.6+u [@] 9	J3+20	5277+w ^{?a}	J5+8
18362.3+x [‡] 9	J+32	1479.7+z [#] 5	J2+4	13419.7+u [@] 11	J3+22	6721+w ^{?a}	J5+10
19999.8+x [‡] 12	J+34	2314.6+z [#] 5	J2+6	15065.1+u [@] 14	J3+24	8216+w ^{?a}	J5+12
y [‡]	J1	3213.5+z [#] 5	J2+8	v ^{&}	J4	9761+w ^{?a}	J5+14
702.8+y [‡] 7	J1+2	4175.4+z [#] 6	J2+10	835.9+v ^{&} 4	J4+2	11362+w ^{?a}	J5+16
1466.0+y [‡] 8	J1+4	5200.4+z [#] 6	J2+12	1724.8+v ^{&} 5	J4+4		
2290.8+y [‡] 8	J1+6	6288.0+z [#] 7	J2+14	2665.3+v ^{&} 7	J4+6		
3174.9+y [‡] 8	J1+8	7437.9+z [#] 7	J2+16	3659.9+v ^{&} 8	J4+8		

[†] Band(A): SD-1 Band, ($\pi=+, \alpha=-1/2$) (**1998Ha21**). Percent population=0.44 4 (**1998Ha21**). Intruder configuration= $\nu(1/2[651], \alpha=-1/2) \pi(6_1 6_2 1/2[301], \alpha=+1/2)$ (**1998Ha21**).

[‡] Band(B): SD-2 Band, ($\pi=-, \alpha=-1/2$) (**1998Ha21**). Percent population=0.40 5 (**1998Ha21**). Intruder configuration= $\nu(1/2[651], \alpha=-1/2) \pi(6_1 1/2[301], \alpha=+1/2) 1/2[301], \alpha=-1/2$ at low frequencies and $\nu(1/2[651], \alpha=-1/2) \pi(6_1 6_2 6_3)$ at high frequencies (**1998Ha21**).

[#] Band(C): SD-3 Band, ($\pi=-, \alpha=+1/2$) (**1998Ha21**). Percent population=0.28 4 (**1998Ha21**). Intruder configuration= $\nu(1/2[651], \alpha=+1/2) \pi(6_1 1/2[301], \alpha=+1/2) 1/2[301], \alpha=-1/2$ at low frequencies and $\nu(1/2[651], \alpha=-1/2) \pi(6_1 6_2 6_3)$ at high frequencies (**1998Ha21**).

[@] Band(D): SD-4 Band, ($\pi=-, \alpha=-1/2$) (**1998Ha21**). Percent population=0.30 4 (**1998Ha21**). Intruder configuration= $\nu(1/2[651], \alpha=-1/2) \pi(6_1 6_2 6_3)$ at low frequencies and $\nu(1/2[651], \alpha=-1/2) \pi(6_1 1/2[301], \alpha=+1/2) 1/2[301], \alpha=-1/2$ at high frequencies (**1998Ha21**).

[&] Band(E): SD-5 Band, ($\pi=+, \alpha=+1/2$) (**1998Ha21**). Percent population=0.22 3 (**1998Ha21**). Intruder configuration= $\nu(1/2[651], \alpha=-1/2) \pi(6_1 6_2 1/2[301], \alpha=-1/2)$ (**1998Ha21**).

^a Band(F): SD-6 Band (**1998Ha21**) (?). Very weakly populated. This band may continue with the following γ ray cascade:

Continued on next page (footnotes at end of table)

$^{124}\text{Sn}(^{29}\text{Si,p5n}\gamma):\text{SD}$ **1998Ha21** (continued) ^{147}Eu Levels (continued)

1199-1136-1079-1018-957-891-829.

^b The band may extend to lower energies with the following γ rays in the SD band cascade due to their possible coincidence relationship: 1136, 1079, 1018, 957, 891 and 829 keV.

 $\gamma(^{147}\text{Eu})$

E_γ	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
703.2 7	0.07 1	702.8+y	J1+2	y	J1
708.1 3		708.1+z	J2+2	z	J2
737.3 3	0.18 2	737.3+x	J+2	x	J
763.2 2	0.22 2	1466.0+y	J1+4	702.8+y	J1+2
771.7 3		1479.7+z	J2+4	708.1+z	J2+2
790.6 1	0.61 6	1527.9+x	J+4	737.3+x	J+2
824.8 1	1.02 10	2290.8+y	J1+6	1466.0+y	J1+4
834.9 2		2314.6+z	J2+6	1479.7+z	J2+4
835.9 4		835.9+v	J4+2	v	J4
842.3 1	1.16 12	2370.2+x	J+6	1527.9+x	J+4
884.1 1	0.91 9	3174.9+y	J1+8	2290.8+y	J1+6
889.0 3		1724.8+v	J4+4	835.9+v	J4+2
892.3 1	1.05 10	3262.5+x	J+8	2370.2+x	J+6
898.9 2		3213.5+z	J2+8	2314.6+z	J2+6
940.5 4		2665.3+v	J4+6	1724.8+v	J4+4
944.0 1	1.03 10	4118.9+y	J1+10	3174.9+y	J1+8
944.0 3		944.0+u	J3+2	u	J3
946.8 1	1.12 11	4209.3+x	J+10	3262.5+x	J+8
961.9 2		4175.4+z	J2+10	3213.5+z	J2+8
994.7 4		3659.9+v	J4+8	2665.3+v	J4+6
994.8 2		1938.8+u	J3+4	944.0+u	J3+2
1001.3 1	0.87 9	5210.6+x	J+12	4209.3+x	J+10
1004.8 1	1.09 11	5123.7+y	J1+12	4118.9+y	J1+10
1025.0 2		5200.4+z	J2+12	4175.4+z	J2+10
1046.2 2		2985.0+u	J3+6	1938.8+u	J3+4
1048.6 4		4708.5+v	J4+10	3659.9+v	J4+8
1056.3 1	0.86 9	6266.9+x	J+14	5210.6+x	J+12
1065.1 1	1.06 11	6188.8+y	J1+14	5123.7+y	J1+12
1087.6 2		6288.0+z	J2+14	5200.4+z	J2+12
1096.3 2		4081.3+u	J3+8	2985.0+u	J3+6
1103.7 5		5812.2+v	J4+12	4708.5+v	J4+10
1112.5 1	1.09 11	7379.4+x	J+16	6266.9+x	J+14
1126.4 1	0.93 9	7315.2+y	J1+16	6188.8+y	J1+14
1149.9 2		7437.9+z	J2+16	6288.0+z	J2+14
1151.6 2		5232.9+u	J3+10	4081.3+u	J3+8
1155.4 4		6967.6+v	J4+14	5812.2+v	J4+12
1169.4 4	0.76 8	8548.8+x	J+18	7379.4+x	J+16
1187.0 2	0.96 10	8502.2+y	J1+18	7315.2+y	J1+16
1203.4 2		6436.3+u	J3+12	5232.9+u	J3+10
1211.8 3		8649.7+z	J2+18	7437.9+z	J2+16
1222.8 4		8190.3+v	J4+16	6967.6+v	J4+14
1226.6 1	0.84 8	9775.4+x	J+20	8548.8+x	J+18
1244 [#]		1244+w	J5+2	w?	J5
1247.3 1	0.71 7	9749.5+y	J1+20	8502.2+y	J1+18
1258.0 3		7694.3+u	J3+14	6436.3+u	J3+12
1271.6 2		9921.3+z	J2+20	8649.7+z	J2+18
1276.0 5		9466.3+v	J4+18	8190.3+v	J4+16
1284.2 1	0.82 8	11059.6+x	J+22	9775.4+x	J+20
1297 [#]		2541+w?	J5+4	1244+w	J5+2

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$^{124}\text{Sn}(^{29}\text{Si},\text{p5n}\gamma):\text{SD}$ **1998Ha21** (continued) $\gamma(^{147}\text{Eu})$ (continued)

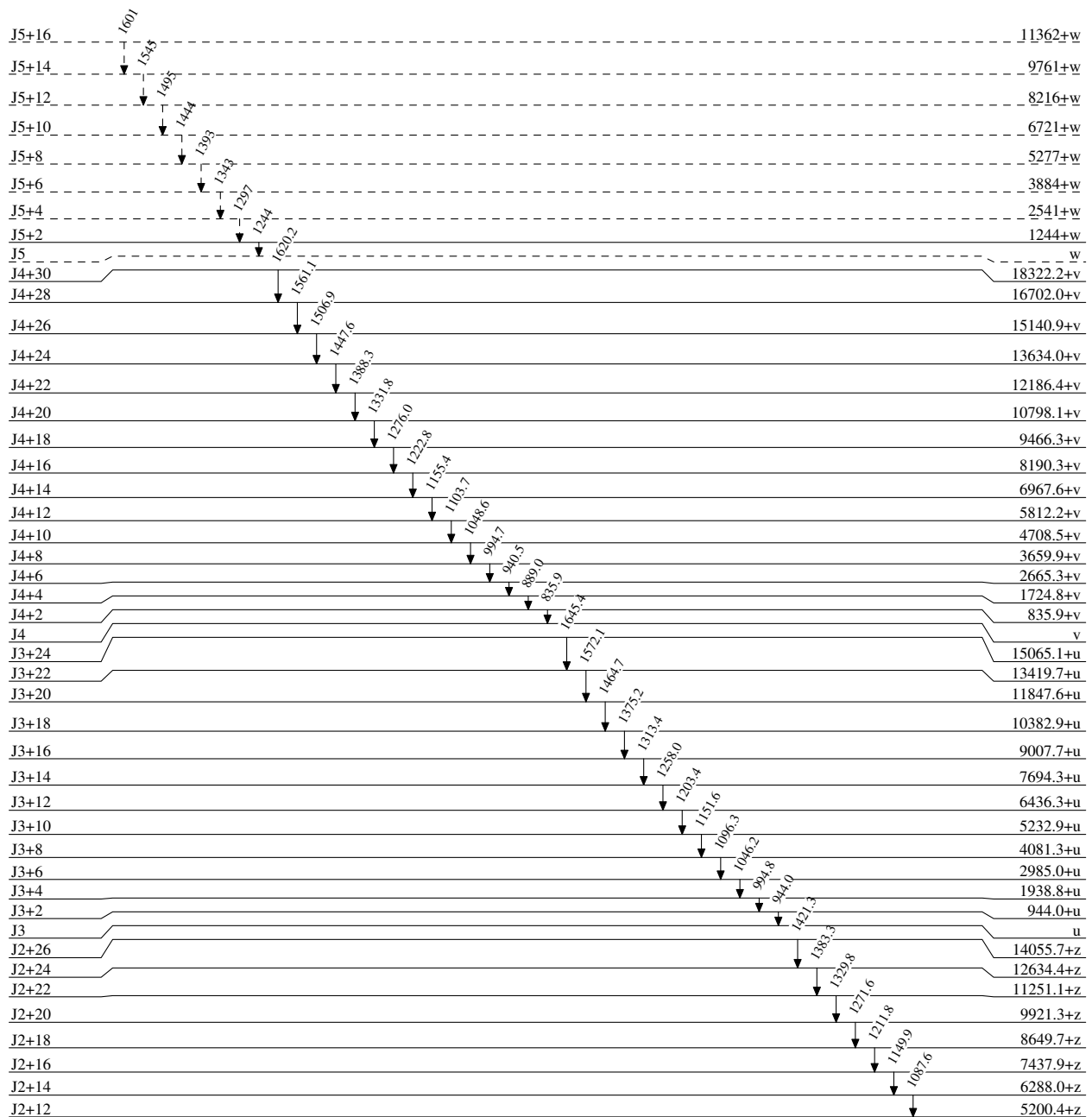
E_γ	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
1307.3 1	0.74 7	11056.8+y	J1+22	9749.5+y	J1+20
1313.4 3		9007.7+u	J3+16	7694.3+u	J3+14
1329.8 3		11251.1+z	J2+22	9921.3+z	J2+20
1331.8 4		10798.1+v	J4+20	9466.3+v	J4+18
1342.7 1	0.67 7	12402.4+x	J+24	11059.6+x	J+22
1343 [#]		3884+w?	J5+6	2541+w?	J5+4
1366.6 2	0.62 6	12423.4+y	J1+24	11056.8+y	J1+22
1375.2 3		10382.9+u	J3+18	9007.7+u	J3+16
1383.3 3		12634.4+z	J2+24	11251.1+z	J2+22
1388.3 6		12186.4+v	J4+22	10798.1+v	J4+20
1393 [#]		5277+w?	J5+8	3884+w?	J5+6
1401.6 2	0.43 4	13804.0+x	J+26	12402.4+x	J+24
1421.3 5		14055.7+z	J2+26	12634.4+z	J2+24
1423.8 2	0.57 6	13847.2+y	J1+26	12423.4+y	J1+24
1444 [#]		6721+w?	J5+10	5277+w?	J5+8
1447.6 4		13634.0+v	J4+24	12186.4+v	J4+22
1460.5 2	0.36 4	15264.5+x	J+28	13804.0+x	J+26
1464.7 4		11847.6+u	J3+20	10382.9+u	J3+18
1474.1 2	0.48 5	15321.3+y	J1+28	13847.2+y	J1+26
1495 [#]		8216+w?	J5+12	6721+w?	J5+10
1497 [‡] 1	0.41 [‡] 4	16818.3+y	J1+30	15321.3+y	J1+28
1497 [‡] 1	0.41 [‡] 4	18315.3+y	J1+32	16818.3+y	J1+30
1506.9 6		15140.9+v	J4+26	13634.0+v	J4+24
1519.3 3	0.22 2	16783.8+x	J+30	15264.5+x	J+28
1531.3 4	0.12 1	19846.6+y	J1+34	18315.3+y	J1+32
1545 [#]		9761+w?	J5+14	8216+w?	J5+12
1561.1 9		16702.0+v	J4+28	15140.9+v	J4+26
1572.1 7		13419.7+u	J3+22	11847.6+u	J3+20
1578.5 4	0.09 1	18362.3+x	J+32	16783.8+x	J+30
1582.7 14	0.03 1	21429.3+y	J1+36	19846.6+y	J1+34
1601 [#]		11362+w?	J5+16	9761+w?	J5+14
1620.2 15		18322.2+v	J4+30	16702.0+v	J4+28
1637.5 8	0.05 1	19999.8+x	J+34	18362.3+x	J+32
1645.4 8		15065.1+u	J3+24	13419.7+u	J3+22

[†] Relative intensities normalized to 1.0 in the plateau region.[‡] Multiply placed with undivided intensity.[#] Placement of transition in the level scheme is uncertain.

$^{124}\text{Sn}(^{29}\text{Si}, p5n\gamma): \text{SD}$ 1998Ha21

Legend

Level Scheme

Intensities: Relative I_γ -----► γ Decay (Uncertain)

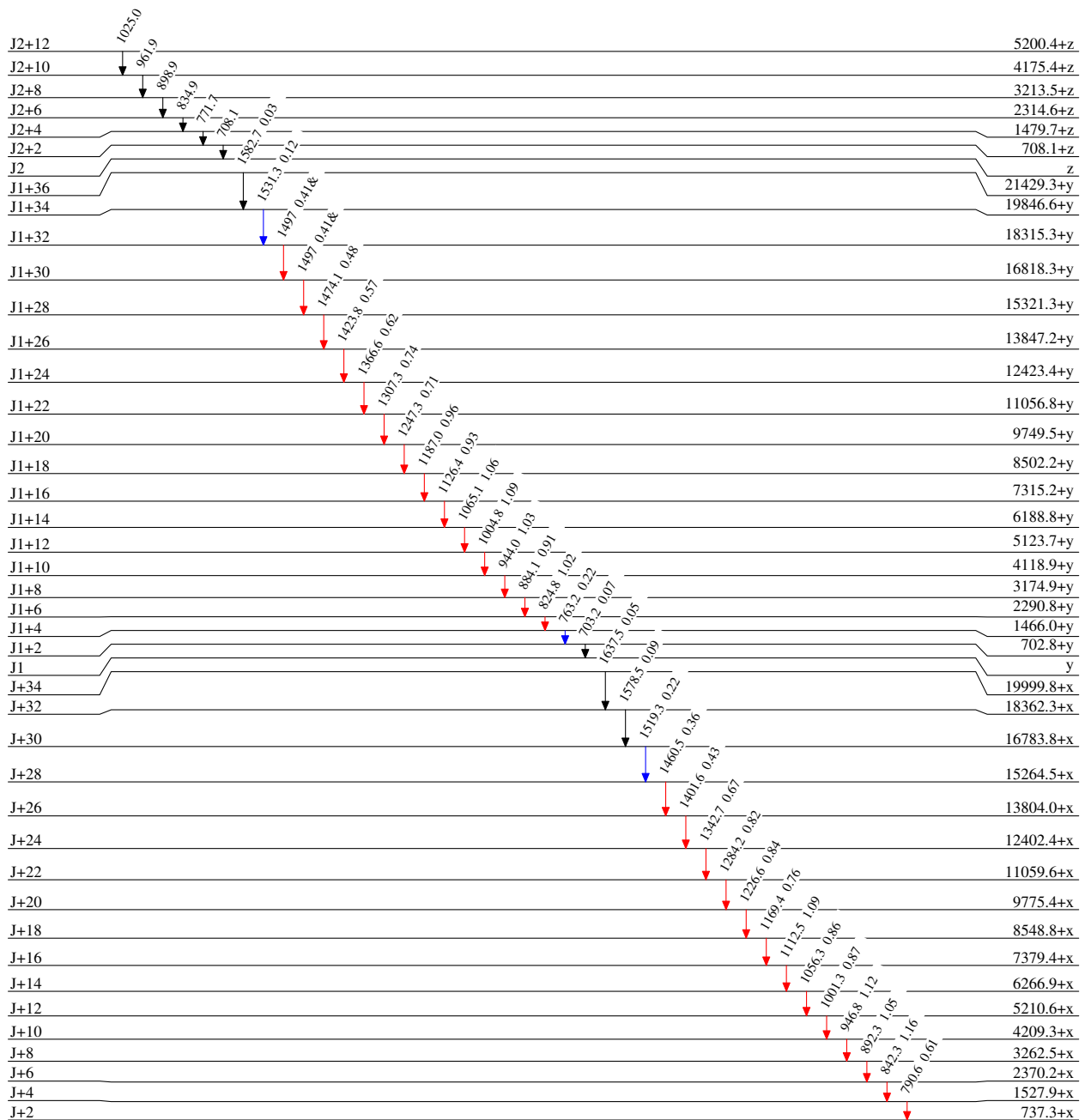
$^{124}\text{Sn}(^{29}\text{Si}, p5n\gamma): \text{SD}$ 1998Ha21

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

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



$^{124}\text{Sn}(^{29}\text{Si}, p5n\gamma): \text{SD} \quad 1998\text{Ha21}$

		Band(C): SD-3 Band, ($\pi=-$, $\alpha=+1/2$) (1998Ha21)	
		J2+26	14055.7+z
		J2+24	1421 12634.4+z
		J2+22	1383 11251.1+z
		J2+20	1330 9921.3+z
		J2+18	1272 8649.7+z
		J2+16	1212 7437.9+z
		J2+14	1150 6288.0+z
		J2+12	1088 5200.4+z
		J2+10	1025 4175.4+z
		J2+8	962 3213.5+z
		J2+6	899 2314.6+z
		J2+4	835 1479.7+z
		J2+2	772 708.1+z
		J2	708 z
		Band(B): SD-2 Band, ($\pi=-$, $\alpha=-1/2$) (1998Ha21)	
		J1+36	21429.3+y
		J1+34	1583 19846.6+y
		J1+32	1531 18315.3+y
		J1+30	1497 16818.3+y
		J1+28	1497 15321.3+y
		J1+26	1474 13847.2+y
		J1+24	1424 12423.4+y
		J1+22	1367 11056.8+y
		J1+20	1307 9749.5+y
		J1+18	1247 8502.2+y
		J1+16	1187 7315.2+y
		J1+14	1126 6188.8+y
		J1+12	1065 5123.7+y
		J1+10	1005 4118.9+y
		J1+8	944 3174.9+y
		J1+6	884 2290.8+y
		J1+4	825 1466.0+y
		J1+2	763 702.8+y
		J1	703 y
		Band(A): SD-1 Band, ($\pi=+$, $\alpha=-1/2$) (1998Ha21)	
		J+34	19999.8+x
		J+32	1638 18362.3+x
		J+30	1578 16783.8+x
		J+28	1519 15264.5+x
		J+26	1460 13804.0+x
		J+24	1402 12402.4+x
		J+22	1343 11059.6+x
		J+20	1284 9775.4+x
		J+18	1227 8548.8+x
		J+16	1169 7379.4+x
		J+14	1112 6266.9+x
		J+12	1056 5210.6+x
		J+10	1001 4209.3+x
		J+8	947 3262.5+x
		J+6	892 2370.2+x
		J+4	842 1527.9+x
		J+2	791 737.3+x
		J	737 x

$^{124}\text{Sn}(^{29}\text{Si,p5n}\gamma):\text{SD}$ 1998Ha21 (continued)

		Band(F): SD-6 Band (1998Ha21) (?)	
		J5+16	11362+w
		J5+14	1601 ↓ 9761+w
		J5+12	1545 ↓ 8216+w
		J5+10	1495 ↓ 6721+w
		J5+8	1444 ↓ 5277+w
		J5+6	1393 ↓ 3884+w
		J5+4	1343 ↓ 2541+w
		J5+2	1297 ↓ 1244+w
		J5	1244 ↓ w
		Band(E): SD-5 Band, ($\pi=+, \alpha=+1/2$) (1998Ha21)	
J4+30	18322.2+v		
J4+28	1620 ↓ 16702.0+v		
J4+26	1561 ↓ 15140.9+v		
J4+24	1507 ↓ 13634.0+v		
J4+22	1448 ↓ 12186.4+v		
J4+20	1388 ↓ 10798.1+v		
J4+18	1332 ↓ 9466.3+v		
J4+16	1276 ↓ 8190.3+v		
J4+14	1223 ↓ 6967.6+v		
J4+12	1155 ↓ 5812.2+v		
J4+10	1104 ↓ 4708.5+v		
J4+8	1049 ↓ 3659.9+v		
J4+6	995 ↓ 2665.3+v		
J4+4	940 ↓ 1724.8+v		
J4+2	889 ↓ 835.9+v		
J4	836 ↓ v		
		Band(D): SD-4 Band, ($\pi=-, \alpha=-1/2$) (1998Ha21)	
J3+24	15065.1+u		
J3+22	1645 ↓ 13419.7+u		
J3+20	1572 ↓ 11847.6+u		
J3+18	1465 ↓ 10382.9+u		
J3+16	1375 ↓ 9007.7+u		
J3+14	1313 ↓ 7694.3+u		
J3+12	1258 ↓ 6436.3+u		
J3+10	1203 ↓ 5232.9+u		
J3+8	1152 ↓ 4081.3+u		
J3+6	1096 ↓ 2985.0+u		
J3+4	1046 ↓ 1938.8+u		
J3+2	995 ↓ 944.0+u		
J3	944 ↓ u		