^{118}Sn(n,n′γ) 1989Mi27

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	K. Kitao	NDS 75,99 (1995)	1-Feb-1993

1989Mi27, 1989De51, 1991Go07: reactor fast neutron; 99.5% enriched target; γ, γ(θ), γ-linear pol.

1991Go24: reactor fast neutron; 98% enriched target; DSA, $T_{1/2}$.

Other: 1978De41, 1989De51.

1978De41 is the report previous to 1989Mi27. However, the following γ′s given by 1978De41 were not confirmed by 1989Mi27: 326.4γ, 720.3γ, 897.4γ, 982.6γ, 1015.2γ, 1383.0γ, 1436.3γ, 1597.5γ, 1693.3γ, 1715.4γ, 1725.0γ, 1882.4γ, 1939.7γ, 1984.0γ, 2094.9γ, 2171.1γ, 2181.7γ, 2588.5γ.

^{118}Sn Levels

E(level)†	Jπ‡	$T_{1/2}$#	E(level)†	Jπ‡	$T_{1/2}$#
0.0	0^+		3089.30? *4*	4^+	
1229.713 *14*	2^+		3137.53 *15*	(0^+)	
1758.537 *25*	0^+	>0.5 ps	3227.72 *7*	$2^+,3^+$	
2042.943 *16*	2^+	>1.1 ps	3228.37 *8*	2^+	0.15 ps *+14−10*
2057.018 *25*	0^+	>0.7 ps	3252.08 *7*	$2,3^+$	0.08 ps *+6−3*
2280.423 *22*	4^+	>1.5 ps	3262.59 *6*	3^+	
2321.38 *4*	5^-		3270.67 *11*	1	0.005 ps *3*
2324.933 *24*	3^-	0.19 ps *+4−3*	3308.57 *15*	2^+	
2328.100 *23*	2^+	>0.2 ps	3355.90 *13*	2^+	
2403.337 *25*	2^+	0.18 ps *+8−4*	3386.37 *8*	3^+	
2488.927 *20*	4^+	>0.55 ps	3427.16 *10*	$(2^+),3$	
2497.29 *4*	0^+		3461.26 *5*	$2^+,3^+,4^+$	
2575.06 *5*	7^-		3462.69? *11*	$2,3^+$	
2677.38 *3*	2^+	>0.28 ps	3540.62 *9*	$2^+,3$	0.11 ps *+23−5*
2733.864 *25*	4^+	0.5 ps *+6−2*	3673.74 *15*		
2738.06 *4*	1^+	0.19 ps *+16−6*	3696.79 *17*	1	0.11 ps *+38−6*
2774.07 *4*	4^-		3709.93 *15*	2^+	
2817.25 *4*	(3^-)		3762.17 *14*	$2,3^+$	
2878.80 *5*	$5^-,(6^+)$		3816.70 *10*	$1,2^+,3$	
2903.89 *4*	2^+	0.077 ps *+20−13*	3857.1 *4*	$1,2^+$	
2929.77 *7*	(0^+)		3898.95 *20*		
2963.53 *4*	4^+		3944.5 *4*	2^+	
2999.55 *6*	6^+		4044.6 *3*		
3015.27? *6*			4109.0 *3*		
3048.43? *5*	4		4126.8 *4*	$1,2^+$	
3057.23 *6*	2^+	0.11 ps *+5−3*			

† From a least-squares fit to E(γ′s).

‡ Given by 1989Mi27 based on γ(θ) and γ linear pol measurement. See also additional comments for each level.

From Doppler shift attenuation of γ′s (1991Go24).

γ(^{118}Sn)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[&]	α[a]	Comments
208.47 *3*	1.29 *4*	2488.927	4^+	2280.423	4^+	M1+E2	−0.17 *4*	0.0763 *7*	α(K)=0.0659 *5*; α(L)=0.0084 *1*; α(M)=0.00164 *3*; α(N+..)=0.00037 *1*
253.68 *3*	0.97 *3*	2575.06	7^-	2321.38	5^-	E2		0.0620	α(K)=0.0516; α(L)=0.0084; α(M)=0.00166; α(N+..)=0.00036
284.66 *12*	0.200 *14*	2042.943	2^+	1758.537	0^+				
[x]345.11 *5*	0.343 *15*								
[x]356.15 *10*	0.246 *12*								
360.4 *2*	0.066 *8*	2403.337	2^+	2042.943	2^+				
446.00 *2*	2.11 *7*	2488.927	4^+	2042.943	2^+	E2[@]		0.0103	α(K)=0.0088; α(L)=0.00121; α(M)=0.00024
449.07 *3*	0.70 *2*	2774.07	4^-	2324.933	3^-	M1+E2	+0.010 *16*	0.0104	α(K)=0.0090; α(L)=0.00110; α(M)=0.00021
452.72 *2*	1.65 *5*	2774.07	4^-	2321.38	5^-	M1+E2	+0.092 *9*	0.0101	α(K)=0.0088; α(L)=0.00108; α(M)=0.00021
492.32 *3*	0.92 *3*	2817.25	(3^-)	2324.933	3^-	D+Q			
(510.5 *1*)	0.80 *19*	2999.55	6^+	2488.927	4^+				E_γ: not seen in this experiment, probably masked by the strong annhiration radiation. Iγ from adopted gammas.
528.83 *2*	4.98 *16*	1758.537	0^+	1229.713	2^+				
[x]553.05 *16*	0.069 *9*								
557.23 *7*	0.254 *11*	2878.80	5^-,(6^+)	2321.38	5^-	D+Q			δ: δ=−1.1 *2* if $J=5^-$ and transition is M1+E2.
[x]568.46 *4*	0.59 *3*								
[x]575.86 *15*	0.096 *8*								
598.47 *5*	0.59 *2*	2878.80	5^-,(6^+)	2280.423	4^+				
683.11 *3*	0.95 *3*	2963.53	4^+	2280.423	4^+	M1+E2	+0.09 *5*		
719.17 *6*	0.47 *2*	2999.55	6^+	2280.423	4^+	E2			
768.00 *4*	0.82 *3*	3048.43?	4	2280.423	4^+	D+Q			Mult.: ΔJ ≠ 1,2. δ: δ=−0.08 *2* if transition is E1+M2, +1.12 *11* if M1+E2.
808.87 *3*	0.83 *3*	3089.30?	4^+	2280.423	4^+	M1+E2	+1.37 *14*		
813.24 *2*	8.1 *3*	2042.943	2^+	1229.713	2^+	M1+E2	−2.34 *16*		
827.30 *2*	2.31 *9*	2057.018	0^+	1229.713	2^+				
[x]960.93 *17*	0.188 *13*								
972.32[b] *5*	0.51[b] *5*	3015.27?		2042.943	2^+	D			Mult.: for doublet.
(972.32[b] *5*)	0.16[b] *4*	3461.26	2^+,3^+,4^+	2488.927	4^+	D			E_γ,I_γ: from Adopted Levels. Mult.: for doublet.
[x]993.74 *10*	0.231 *15*								
1050.71 *2*	18.6 *7*	2280.423	4^+	1229.713	2^+	E2[@]			
1058.27 *7*	0.37 *2*	3386.37	3^+	2328.100	2^+	M1+E2			δ: 1/δ=−0.09 *2*.
1091.84 *7*	0.63 *3*	2321.38	5^-	1229.713	2^+				
1095.19 *2*	8.0 *3*	2324.933	3^-	1229.713	2^+	E1(+M2)	+0.026 *6*		
1098.37 *2*	4.08 *16*	2328.100	2^+	1229.713	2^+	E2(+M1)			δ: 1/δ=+0.018 *10*.
[x]1114.94 *7*	0.218 *12*								
[x]1151.1 *2*	0.046 *7*								
[x]1159.9 *2*	0.040 *6*								
1173.62 *2*	3.77 *15*	2403.337	2^+	1229.713	2^+	M1+E2	+1.07 *9*		
1180.7 *2*	0.142 *10*	3461.26	2^+,3^+,4^+	2280.423	4^+	E2			

^{118}Sn(n,n′γ) 1989Mi27 (continued)

γ(^{118}Sn) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	δ [&]	Comments
[x]1206.38 *8*	0.240 *13*							
[x]1214.82 *8*	0.251 *13*							
1219.64 *5*	0.49 *2*	3262.59	3^+	2042.943	2^+	M1+E2	+0.14 *4*	
1229.69 *2*	100	1229.713	2^+	0.0	0^+	E2		
[x]1244.02 *9*	0.235 *12*							
1259.19 *3*	1.33 *6*	2488.927	4^+	1229.713	2^+	E2		
1267.57 *3*	0.67 *3*	2497.29	0^+	1229.713	2^+			
[x]1281.91 *16*	0.084 *7*							
[x]1311.89 *16*	0.129 *8*							
[x]1351.3 *2*	0.086 *7*							
[x]1365.92 *15*	0.164 *10*							
[x]1374.70 *12*	0.130 *8*							
1381.79 *16*	0.119 *8*	3709.93	2^+	2328.100	2^+	M1+E2		
1384.24 *15*	0.168 *9*	3427.16	(2^+),3	2042.943	2^+	D+Q		
1393.4 *2*	0.050 *7*	3673.74		2280.423	4^+			
[x]1403.57 *15*	0.121 *8*							
1419.74 *10*	0.246 *13*	3462.69?	$2,3^+$	2042.943	2^+			
1447.66 *3*	0.96 *4*	2677.38	2^+	1229.713	2^+	M1+E2	+2.46 *+17−13*	
[x]1472.9 *2*	0.128 *8*							
[x]1479.0 *2*	0.109 *8*							
[x]1485.65 *14*	0.156 *9*							
[x]1490.6 *2*	0.080 *7*							
[x]1498.1 *3*	0.078 *7*							
1504.14 *2*	2.31 *10*	2733.864	4^+	1229.713	2^+	E2 [@]		
1508.33 *3*	1.06 *5*	2738.06	1^+	1229.713	2^+	M1+E2	−0.8 *+9−5*	
[x]1522.2 *2*	0.053 *7*							
[x]1535.9 *2*	0.084 *7*							
[x]1548.6 *2*	0.168 *10*							
[x]1557.05 *13*	0.170 *9*							
[x]1580.5 *2*	0.063 *7*							
1587.1 *4*	0.025 *5*	2817.25	(3^-)	1229.713	2^+	D		
[x]1612.57 *15*	0.145 *8*							
[x]1617.2 *3*	0.058 *6*							
[x]1640.1 *2*	0.049 *6*							
1674.10 *6*	0.38 *2*	2903.89	2^+	1229.713	2^+	E2(+M1)		δ: 17 *+33−9*. Other: −0.40 *10* (1991Go07).
[x]1685.30 *13*	0.128 *8*							
[x]1690.1 *2*	0.114 *8*							
[x]1695.1 *2*	0.099 *7*							
1700.04 *6*	0.301 *14*	2929.77	(0^+)	1229.713	2^+			
[x]1707.4 *2*	0.078 *7*							
[x]1765.5 *2*	0.053 *6*							
[x]1769.82 *13*	0.147 *9*							
[x]1774.0 *2*	0.070 *6*							
1827.36 *12*	0.166 *9*	3057.23	2^+	1229.713	2^+	M1+E2		δ: −0.7 *+3−2* or −5 *+6−2*. Other: −0.7 *+2−3* or −5 *+2−6* (1991Go07).

$^{118}_{50}Sn_{68}$-3

^{118}Sn(n,n′γ) 1989Mi27 (continued)

γ(^{118}Sn) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
[x]1905.31 *12*	0.235 *11*						
1907.80 *15*	0.143 *8*	3137.53	(0^+)	1229.713	2^+		
[x]1951.7 *2*	0.075 *6*						
[x]1959.8 *2*	0.039 *5*						
[x]1986.2 *2*	0.085 *7*						
1997.99 *6*	0.46 *2*	3227.72	$2^+,3^+$	1229.713	2^+	E2	
[x]2010.2 *3*	0.058 *6*						
2022.35 *6*	0.40 *2*	3252.08	$2,3^+$	1229.713	2^+	D+Q	δ: $1/\delta$=0.07 *3* if J^π(3252 level)=3^+.
2042.92 *2*	7.1 *3*	2042.943	2^+	0.0	0^+	E2[@]	
[x]2075.7 *2*	0.126 *7*						
2078.82 *16*	0.232 *11*	3308.57	2^+	1229.713	2^+	M1+E2	δ: −0.21 *9* or +4 *2*.
[x]2123.5 *3*	0.093 *9*						
2126.19 *13*	0.186 *11*	3355.90	2^+	1229.713	2^+	M1+E2	δ: −0.34 *9* or $1/\delta$=+0.008 *9*.
[x]2145.8 *3*	0.062 *6*						
2197.41 *12*	0.165 *9*	3427.16	$(2^+),3$	1229.713	2^+	D+Q	
[x]2213.5 *3*	0.025 *5*						
2231.77 *17*	0.167 *9*	3461.26	$2^+,3^+,4^+$	1229.713	2^+	E2	
2310.88 *8*	0.337 *15*	3540.62	$2^+,3$	1229.713	2^+	D+Q	
2324.7 *2*	0.086 *6*	2324.933	3^-	0.0	0^+		
2328.14 *5*	0.75 *3*	2328.100	2^+	0.0	0^+	E2[@]	
2443.9 *2*	0.100 *8*	3673.74		1229.713	2^+		
[x]2456.5 *4*	0.034 *6*						
2466.9 *3*	0.039 *6*	3696.79	1	1229.713	2^+	D+Q	
[x]2475.1 *3*	0.056 *7*						
[x]2508.7 *3*	0.059 *7*						
2532.43 *14*	0.187 *10*	3762.17	$2,3^+$	1229.713	2^+	D+Q	
[x]2541.7 *3*	0.058 *6*						
[x]2565.0 *3*	0.051 *7*						
2586.96 *10*	0.276 *13*	3816.70	$1,2^+,3$	1229.713	2^+	D+Q	
[x]2608.8 *2*	0.135 *8*						
2627.3 *5*	0.057 *7*	3857.1	$1,2^+$	1229.713	2^+		
[x]2634.7 *8*	0.038 *6*						
[x]2665.1 *3*	0.072 *6*						
2669.2 *2*	0.137 *8*	3898.95		1229.713	2^+		
2677.35 *4*	1.12 *5*	2677.38	2^+	0.0	0^+	E2[@]	
2714.7 *5*	0.054 *6*	3944.5	2^+	1229.713	2^+		
[x]2718.8 *3*	0.126 *13*						
[x]2729.3 *5*	0.063 *7*						
2738.10 *10*	0.364 *16*	2738.06	1^+	0.0	0^+	M1	
2814.9 *3*	0.107 *9*	4044.6		1229.713	2^+		
[x]2824.4 *6*	0.054 *7*						
[x]2873.0 *5*	0.045 *6*						
2879.3 *3*	0.106 *8*	4109.0		1229.713	2^+		

$^{118}_{50}Sn_{68}$-4

^{118}Sn(n,n′γ) 1989Mi27 (continued)

γ(^{118}Sn) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]
[x]2888.0 *4*	0.075 *7*					
2897.1 *4*	0.084 *6*	4126.8	1,2$^+$	1229.713	2$^+$	
2903.90 *5*	1.04 *4*	2903.89	2$^+$	0.0	0$^+$	E2[@]
[x]2944.0 *5*	0.089 *8*					
[x]2959.8 *3*	0.145 *10*					
[x]3000.1 *4*	0.082 *7*					
[x]3032.6 *3*	0.093 *8*					
3057.22 *6*	0.73 *3*	3057.23	2$^+$	0.0	0$^+$	E2[@]
[x]3111.4 *4*	0.055 *7*					
[x]3123.5 *5*	0.102 *8*					
3228.32 *8*	0.47 *2*	3228.37	2$^+$	0.0	0$^+$	E2[@]
3270.62 *11*	0.41 *2*	3270.67	1	0.0	0$^+$	D
3308.6 *3*	0.063 *7*	3308.57	2$^+$	0.0	0$^+$	E2
3355.6 *4*	0.046 *6*	3355.90	2$^+$	0.0	0$^+$	E2
[x]3586.9 *2*	0.097 *8*					
[x]3636.7 *3*	0.045 *7*					
3696.8 *2*	0.123 *9*	3696.79	1	0.0	0$^+$	
3710.1 *4*	0.075 *7*	3709.93	2$^+$	0.0	0$^+$	E2
3857.0 *7*	0.068 *7*	3857.1	1,2$^+$	0.0	0$^+$	
3944.4 *7*	0.036 *6*	3944.5	2$^+$	0.0	0$^+$	E2
[x]3973.1 *6*	0.038 *6*					
[x]3983.0 *6*	0.040 *7*					
4126.3 *9*	0.030 *6*	4126.8	1,2$^+$	0.0	0$^+$	

[†] From 1989Mi27.
[‡] From 1989Mi27. Relative to I(1229.7γ)=100 at θ=125°.
[#] From 1989Mi27, values based on γ(θ) and γ(pol). See also additional comments for each G.
[@] Stretched E2 from A_2 and A_4 values.
[&] From γ(θ) (1989Mi27), unless otherwise noted.
[a] 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.
[b] Multiply placed with intensity suitably divided.
[x] γ ray not placed in level scheme.

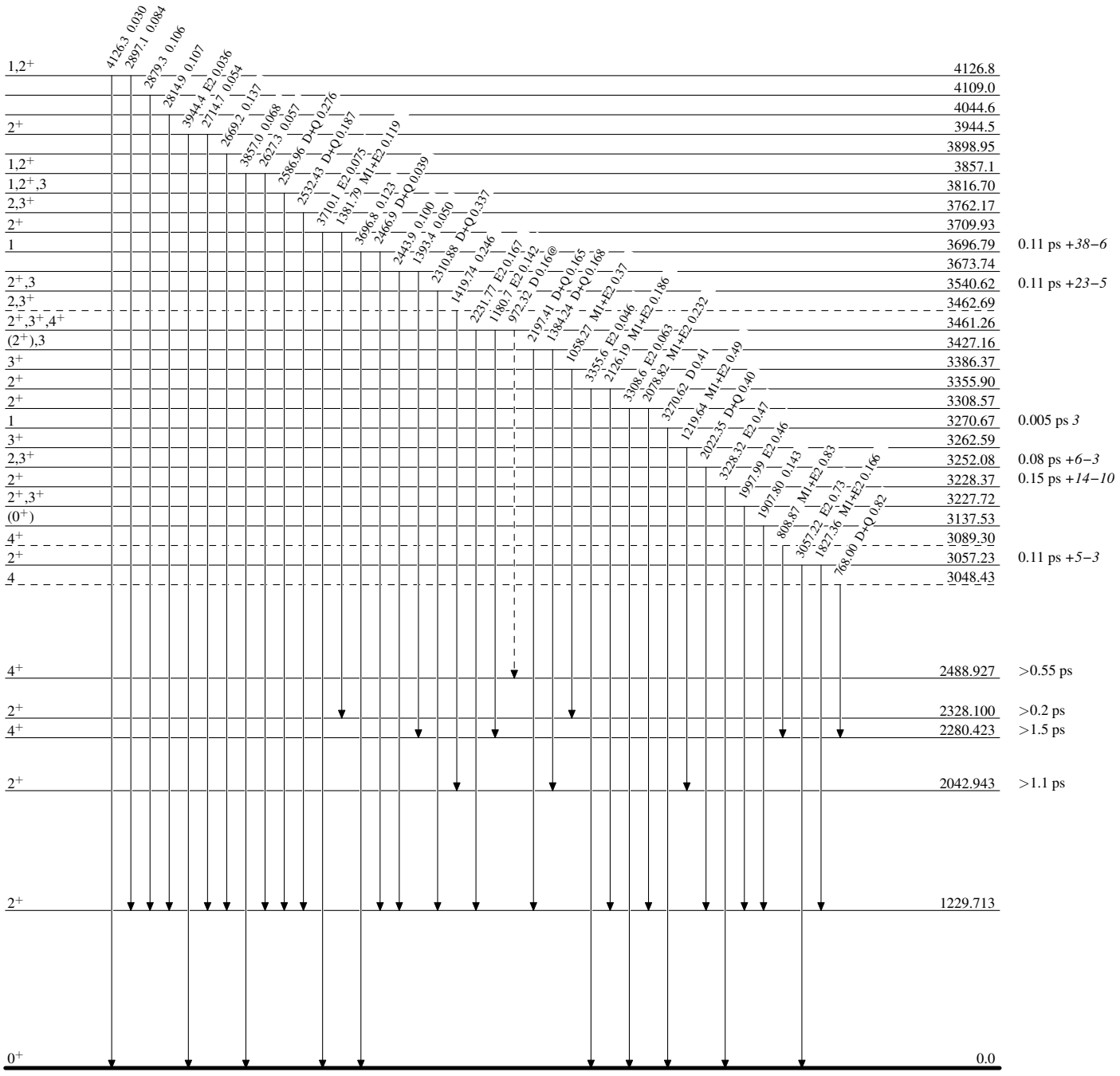
$^{118}_{50}Sn_{68}$-5

^{118}Sn(n,n′γ) 1989Mi27

Level Scheme

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

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)

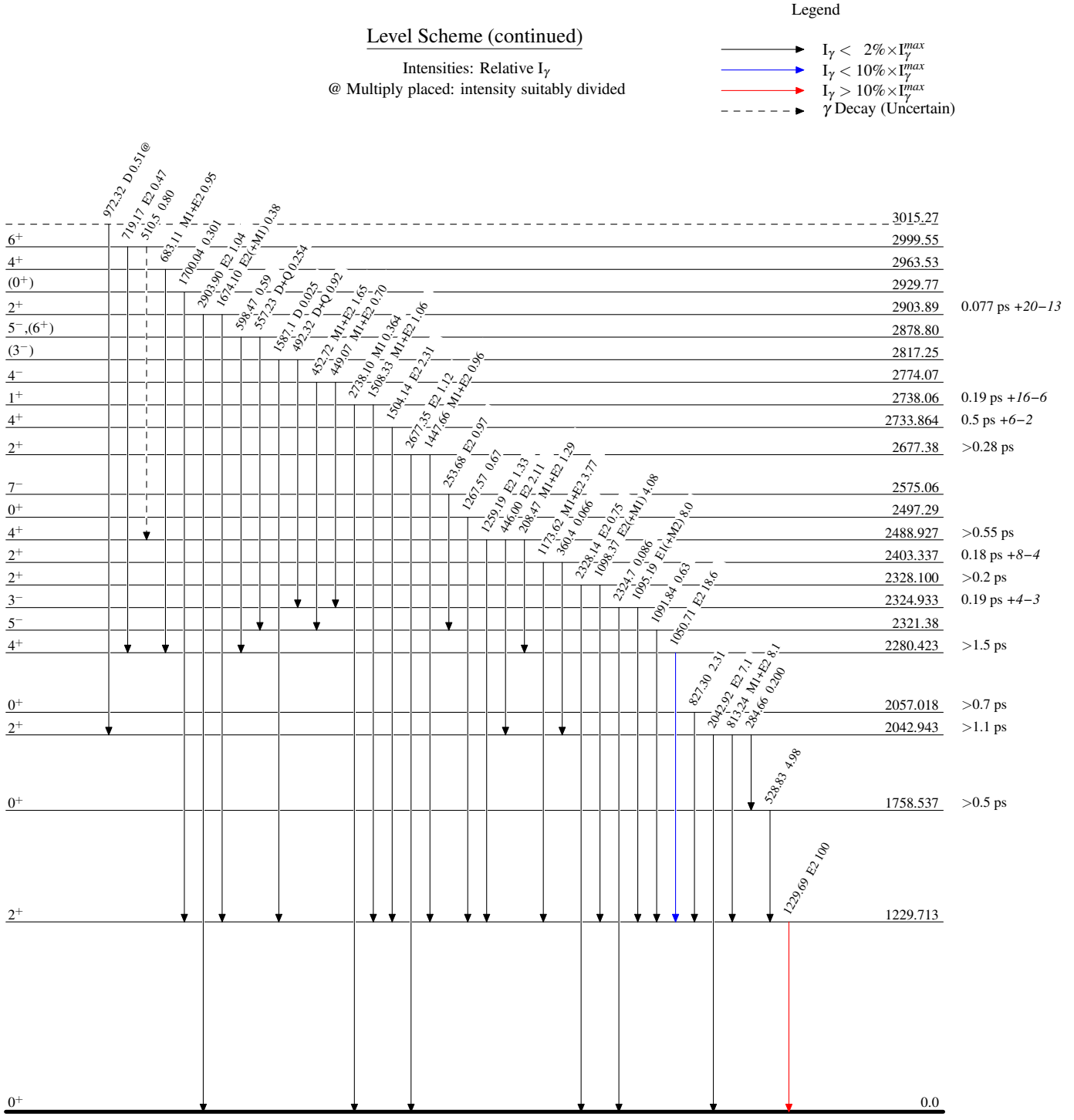


$^{118}_{50}Sn_{68}$

^{118}Sn(n,n′γ) 1989Mi27

Level Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided



$^{118}_{50}Sn_{68}$