^{116}Sn(p,nγ) 1991Ga15

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 717 (2010)	1-Dec-2009

E(p)=6.3,6.7,7.2 MeV (1991Ga15); 5.2-7.4, 15 MeV (1976Ka19).
Measured: Eγ, Iγ, $T_{1/2}(\gamma)$, nγ-coin, γγ, excit (1991Ga15,1976Ka19) ce supermagnetic lens spectrometer, Si (1991Ga15).
The α(K)exp were normalized using the 719γ and 1160γ in ^{117}Sb taken as E2.
Others: 1972MoYL, 1973ChYA, 1974SaYZ, 1975KaZG, 1976MoYV, 1976Va16.
A 571 γ reported by 1976Ka19 but not seen by 1991Ga15 has not been adopted.
The level scheme is as given by 1991Ga15.

^{116}Sb Levels

E(level)	J^{π} †	$T_{1/2}$ ‡	Comments
0	3^+		J^{π}: based on γ multipolarities.
93.856 *19*	1^+		J^{π}: adopted value.
103.040 *15*	2^+	<1 ns	
410.864 *20*	4^+	<1 ns	
455.208 *22*	3^-	2.1 ns *3*	
466.103 *21*	3^+	<1 ns	
503.09 *5*	$5^{(+)}$	<1 ns	
518.051 *23*	2^-	<1 ns	
546.34 *6*	4^+	<1 ns	
550.866 *22*	2^+		
574.59 *3*	2^+		
612.84 *3*	4^-	<1 ns	
654.32 *5*	3^+	<1 ns	
731.714 *21*	1^+	<1 ns	
735.42 *3*	4^+	<1 ns	
815.13 *3*	3^+		
820.92 *4*	5^-	<1 ns	
841.10 *5*	$6^{(+)}$	<1 ns	
881.65 *3*	3^+		
917.74 *3*	1^+		
948.29 *4*	4^+		
997.95 *21*	$(3^-,4^-)$		
1045.40 *4*	$(4)^-$		
1065.24 *5*	$(5)^+$		
1076.76 *5*	$(5,3)^+$		
1087.54 *5*	$4^+,3^+,2^+$		
1096.11 *11*	(2,3,4)		
1127.42 *11*	(2)		
1138.85 *7*	4^+		
1158.49 *7*	1^+		
1223.21 *8*	3,2		
1226.12 *8*			
1336.58 *10*	2,3		
1385.75 *11*	1,2,3		
1407.91 *11*	(3,4)		
1425.47 *10*	(1,2,3)		
1481.11 *11*	(1 to 4)		
1483.34 *11*	$(2 \text{ to } 5)^-$		

† Spins have been determined from ce and by Hauser-Feshbach analysis of normalized cross sections.
‡ From 1976Ka19.

^{116}Sn(p,nγ) 1991Ga15 (continued)

γ(^{116}Sb)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
92.23 *4*	7.6 *13*	503.09	$5^{(+)}$	410.864	4^+		
93.88 *3*	145 *20*	93.856	1^+	0	3^+	E2	
103.01 *2*	410 *43*	103.040	2^+	0	3^+	M1	B(M1)(W.u.)>0.020
108.47 *3*	13.4 *13*	574.59	2^+	466.103	3^+		
157.14 *9*	≤50[#]	731.714	1^+	574.59	2^+		I_γ: derived from the level scheme.
157.60 *3*	≤50	612.84	4^-	455.208	3^-	M1	B(M1)(W.u.)>0.0052
180.83 *3*	5.2 *3*	731.714	1^+	550.866	2^+	M1,E2	α(K)exp=0.14 *3*
208.09 *2*	4.8 *5*	820.92	5^-	612.84	4^-	M1,E2	α(K)exp=0.090 *20*
224.14 *2*	<1	1065.24	$(5)^+$	841.10	$6^{(+)}$	M1	
293.95 *9*	3.2 *3*	948.29	4^+	654.32	3^+	M1,E2	
[x]298.53 *2*	3.8 *3*						
307.79 *3*	18.3 *12*	410.864	4^+	103.040	2^+	E2,(M1)	α(K)exp=0.0286 *22*
330.9 *1*	2.6 *3*	881.65	3^+	550.866	2^+		
338.01 *1*	2.6 *3*	841.10	$6^{(+)}$	503.09	$5^{(+)}$	M1,(E2)	
341.34 *3*	1.8 *3*	1076.76	$(5,3)^+$	735.42	4^+	M1,E2	
[x]349.66 *8*	2.4 *4*						
352.16 *2*	115.0 *18*	455.208	3^-	103.040	2^+	E1	α(K)exp=0.0055 *5* B(E1)(W.u.)=2.6×10^{-6} *4*
363.06 *2*	95.0 *20*	466.103	3^+	103.040	2^+	M1,E2	α(K)exp=0.0153 *18*
365.5 *1*	1 *1*	820.92	5^-	455.208	3^-		
366.87 *2*	21.9 *5*	917.74	1^+	550.866	2^+		
[x]374.56 *5*	2.4 *3*						
395.7 *1*	19.5 *8*	1127.42	(2)	731.714	1^+		
401.9 *2*	1.8 *3*	948.29	4^+	546.34	4^+		
404.27 *3*	12.9 *4*	815.13	3^+	410.864	4^+		
410.91 *3*	100.0 *16*	410.864	4^+	0	3^+	M1,E2	α(K)exp=0.0117 *10*
424.20 *3*	106.0 *18*	518.051	2^-	93.856	1^+	E1	α(K)exp=0.0038 *8* B(E1)(W.u.)>2.8×10^{-6}
[x]426.13 *2*	1.4 *3*						
432.51 *4*	2.3 *3*	1045.40	$(4)^-$	612.84	4^-		
447.83 *6*	9.6 *3*	550.866	2^+	103.040	2^+	M1,E2	α(K)exp=0.0089 *20*
455.19 *7*	24.2 *6*	455.208	3^-	0	3^+	E1	B(E1)(W.u.)=2.5×10^{-7} *4*
457.01 *2*	39.4 *8*	550.866	2^+	93.856	1^+	M1,E2	
466.11 *5*	14.2 *4*	466.103	3^+	0	3^+	M1,E2	α(K)exp=0.0079 *15*
470.79 *4*	16.5 *18*	881.65	3^+	410.864	4^+	M1,E2	α(K)exp=0.0085 *16*
471.62 *6*	10.6 *19*	574.59	2^+	103.040	2^+	M1,E2	α(K)exp=0.0082 *17*
479.9 *2*	25 *9*	997.95	$(3^-,4^-)$	518.051	2^-	(M1,E2)	
[x]480.2 *4*	≤90[@]						
480.8 *4*	≤90[@]	574.59	2^+	93.856	1^+	(M1,E2)	α(K)exp=0.0078 *12* for 480 doublet.
[x]482.3 *1*	4.1 *13*						
484.6 *1*	1.3 *3*	1138.85	4^+	654.32	3^+		
[x]491.45 *7*	3.2 *3*						
518.04 *3*	32.7 *8*	518.051	2^-	0	3^+	E1	α(K)exp=0.0018 *5* B(E1)(W.u.)>4.8×10^{-7}
537.43 *5*	1.3 *3*	948.29	4^+	410.864	4^+		
[x]545.4 *2*	<2						
546.33 *6*	27.9 *8*	546.34	4^+	0	3^+	M1,(E2)	α(K)exp=0.0066 *10*
550.83 *7*	≤175[&]	550.866	2^+	0	3^+	(M1,E2)	α(K)exp=0.0054 *6* for 550 doublet.
551.4 *2*	≤175[&]	654.32	3^+	103.040	2^+	(M1,E2)	α(K)exp=0.0054 *6* for 550 doublet.
571.80 *6*	2.9 *3*	1226.12		654.32	3^+		
574.5 *1*	11.0 *6*	574.59	2^+	0	3^+	M1,E2	α(K)exp=0.0043 *14*
583.6 *3*	4.0 *15*	1158.49	1^+	574.59	2^+		
590.22 *3*	4.8 *3*	1045.40	$(4)^-$	455.208	3^-	M1,(E2)	

Continued on next page (footnotes at end of table)

^{116}Sn(p,nγ) 1991Ga15 (continued)

γ(^{116}Sb) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
[x]612.38 *9*	≤4.4[a]						
612.89 *5*	≤4.4[#]	612.84	4^-	0	3^+	E1	B(E1)(W.u.)>1.00×10^{-7}
621.47 *5*	3.8 *3*	1087.54	$4^+,3^+,2^+$	466.103	3^+	M1	
628.66 *3*	71.0 *19*	731.714	1^+	103.040	2^+		
630.0 *1*	10.3 *9*	1096.11	(2,3,4)	466.103	3^+		
[x]635.5 *1*	6.8 *4*						
637.87 *2*	17.4 *6*	731.714	1^+	93.856	1^+	M1,E2	α(K)exp=0.0037 *8*
654.33 *5*	≤13.5[b]	654.32	3^+	0	3^+	(M1,E2)	α(K)exp=0.0043 *9* for 654 doublet.
[x]654.60 *5*	≤13.5[b]						
[x]662.8 *3*	0.8 *3*						
672.6 *2*	0.8 *3*	1138.85	4^+	466.103	3^+		
[x]701.7 *1*	3.3 *4*						
705.2 *1*	19.0 *7*	1223.21	3,2	518.051	2^-		
712.07 *4*	25.6 *8*	815.13	3^+	103.040	2^+	E2,(M1)	α(K)exp=0.0023 *4*
[x]720.7 *2*	7.2 *9*						
735.42 *3*	27.6 *18*	735.42	4^+	0	3^+	M1,E2	α(K)exp=0.0026 *3*
[x]752.78 *3*	1.0 *3*						
762.0 *1*	18.2 *12*	1336.58	2,3	574.59	2^+		
[x]775.87 *2*	1.8 *3*						
778.59 *3*	10.4 *5*	881.65	3^+	103.040	2^+		
[x]782.6 *1*	7.5 *4*						
785.7 *2*	9.0 *5*	1336.58	2,3	550.866	2^+		
815.3 *2*	14.4 *6*	815.13	3^+	0	3^+		
823.7 *2*	18.9 *7*	917.74	1^+	93.856	1^+		
[x]862.5 *2*	5.6 *4*						
867.7 *1*	7.5 *5*	1385.75	1,2,3	518.051	2^-		
870.5 *1*	11.1 *5*	1483.34	(2 to 5)$^-$	612.84	4^-	M1,E2	
874.7 *1*	15.7 *12*	1425.47	(1,2,3)	550.866	2^+		
[x]894.6 *1*	10.5 *5*						
907.0 *2*	2.0 *4*	1425.47	(1,2,3)	518.051	2^-		
917.82 *8*	25.0 *10*	917.74	1^+	0	3^+		
948.28 *6*	4.4 *8*	948.29	4^+	0	3^+	E2,(M1)	
952.7 *1*	4.8 *5*	1407.91	(3,4)	455.208	3^-		
[x]1012.7 *1*	<20						
1025.9 *1*	5.5 *9*	1481.11	(1 to 4)	455.208	3^-		
[x]1038.8 *2*	3.5 *5*						
1055.48 *8*	29.4 *12*	1158.49	1^+	103.040	2^+		
1064.6 *1*	11.8 *7*	1158.49	1^+	93.856	1^+		
1087.4 *1*	3.6 *10*	1087.54	$4^+,3^+,2^+$	0	3^+		
1129.3 *1*	7.4 *5*	1223.21	3,2	93.856	1^+		
1138.8 *1*	5.8 *4*	1138.85	4^+	0	3^+	E2,(M1)	
[x]1322.7 *2*	4.4 *4*						

[†] From 1991Ga15. Evaluators give the relative Iγ as given in the authors′ table 2. Some of these are discrepant with the branching ratios in the authors′ level scheme.
[‡] From α(K)exp (1991Ga15), mult without α(K)exp are from adopted γ′s.
[#] Iγ=45 *5* for 157 doublet.
[@] Iγ=80 *10* for 480 doublet.
[&] Iγ=165 *10* for 550 doublet.
[a] Iγ=4.0 *4* for 612 doublet.
[b] Iγ=12.2 *13* for 654 doublet.
[x] γ ray not placed in level scheme.

^{116}Sn(p,nγ) 1991Ga15

Level Scheme

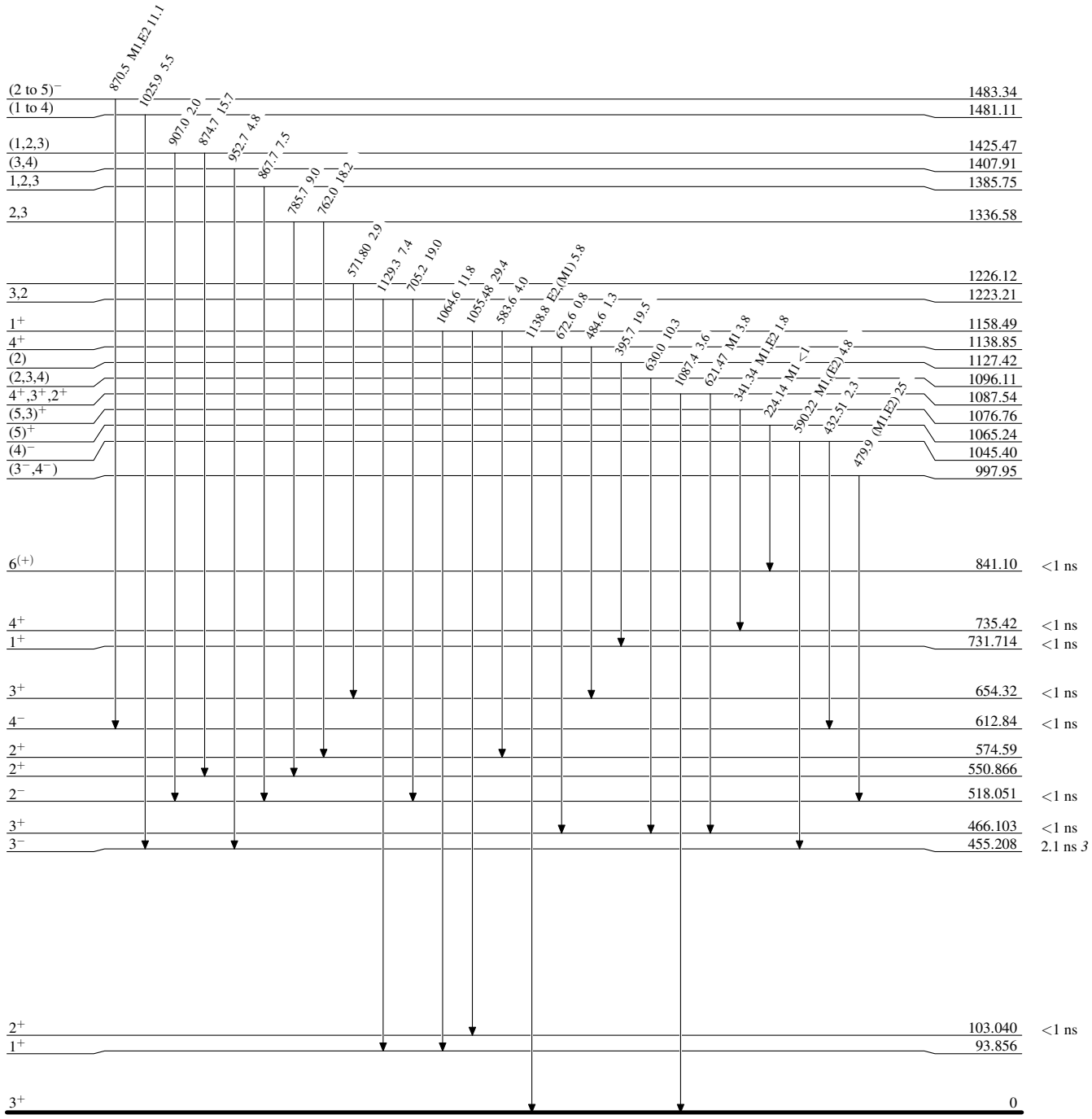
Intensities: Relative I_γ

Legend

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

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

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



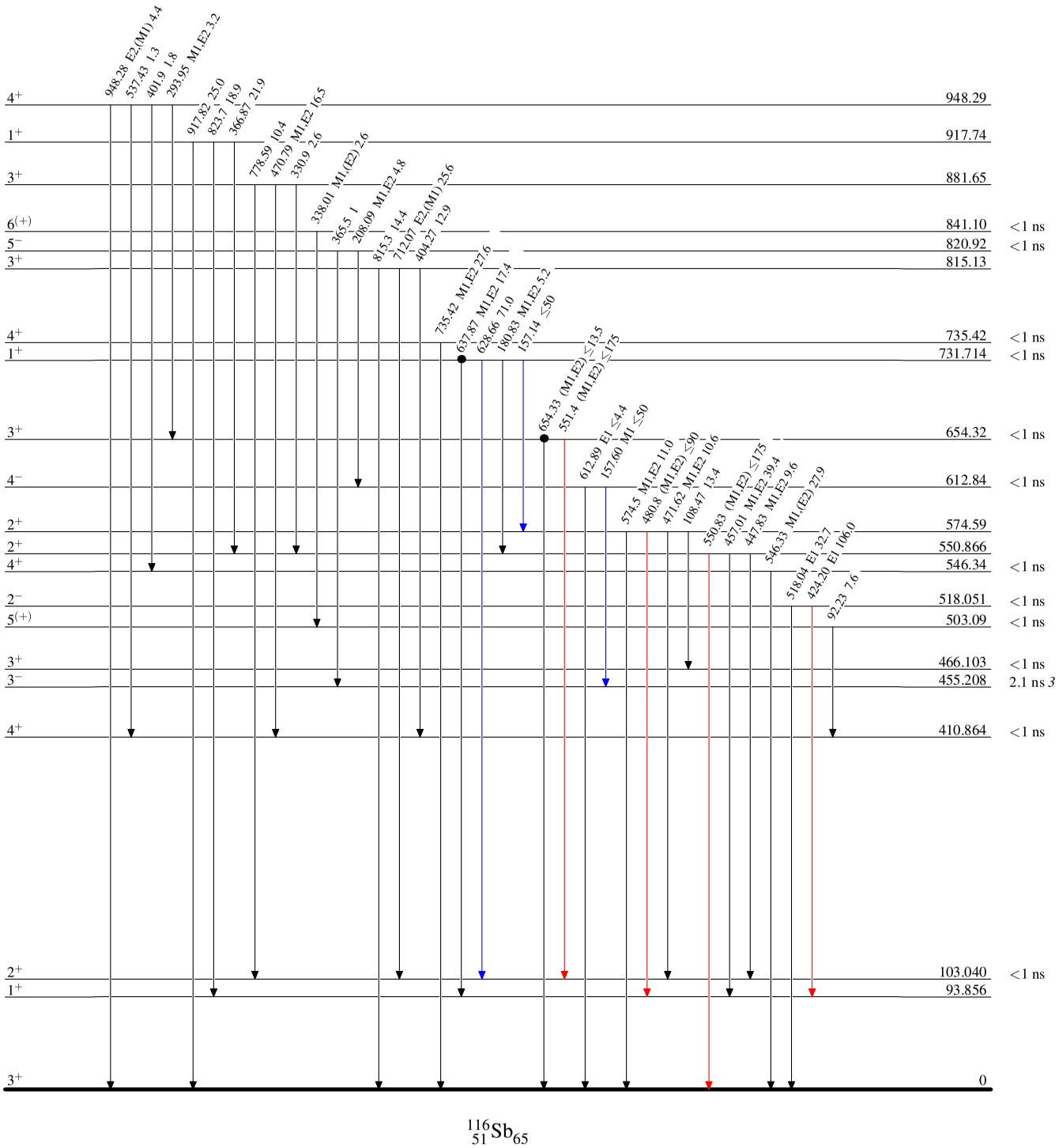
$^{116}_{51}Sb_{65}$

^{116}Sn(p,nγ) 1991Ga15

Level Scheme (continued)

Intensities: Relative I_γ

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

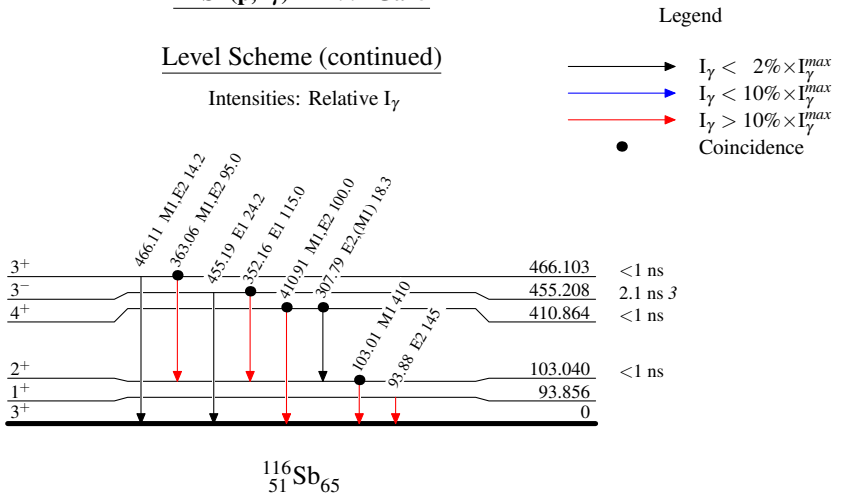


$^{116}_{51}Sb_{65}$

^{116}Sn(p,nγ) 1991Ga15

Level Scheme (continued)

Intensities: Relative I_γ



$^{116}_{51}Sb_{65}$