^{124}Sn(γ,γ′),(pol γ,γ′) 1998Go07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Katakura, Z. D. Wu	NDS 109, 1655 (2008)	1-Apr-2008

1998Go07: Nuclear resonance fluorescence(NRF) with 4.1, 7.5 and 10 MeV unpolarized bremsstrahlung and 12 MeV linearly polarized bremsstrahlung; enriched target; measured γ, γ′(90°)/γ′(127°) and, asymmetry; deduced $\Gamma^2_{\gamma 0}/\Gamma_\gamma$, J, π, B(E1), B(M1).

1994Go25: Nuclear resonance fluorescence with 4.1 MeV unpolarized, 10 MeV unpolarized and 12 MeV linearly polarized bremsstrahlung; enriched target; measured γ, γ′(90°)/γ′(127°), asymmetry; deduced $\Gamma^2_{\gamma 0}/\Gamma_\gamma$.

1999Br12: Nuclear resonance fluorescence (NRF) with 4.3 MV Dynamitron; enriched target > 96 %.

2000Br05: Nuclear resonance fluorescence (NRF) with 4.3 MV Dynamitron; Angular distribution, linear polarization.

^{124}Sn Levels

B(E1) and B(M1) values of levels above 4.2 MeV were calculated by assuming $\Gamma_{\gamma 0}/\Gamma_\gamma$=1.0 (1998Go07).

E(level)†	Jπ#	$T_{1/2}$&	$\Gamma^2_{\gamma 0}/\Gamma_\gamma$a	Comments
0.0	0+@			
1131.8‡ *4*	2+@	0.93 ps *13*	0.49b *7*	$T_{1/2}$: from $\Gamma^2_{\gamma 0}/\Gamma_\gamma$.
2426.5‡ *5*	2+@	0.72 ps *18*	0.41b *10*	$T_{1/2}$: from $\Gamma^2_{\gamma 0}/\Gamma_\gamma$ and branching(2426γ)=0.65 *5* (see adopted gammas). $\Gamma^2_{\gamma 0}/\Gamma_\gamma$ from 1994Go25. 2005Br05 gives 2.1 *11* but it seems to be misprinted.
3214.8‡ *4*	2+@	0.044 ps *6*	8.9b *10*	$T_{1/2}$: from $\Gamma^2_{\gamma 0}/\Gamma_\gamma$ and branching(3214γ)=0.85 *7* (see adopted gammas).
3490.1‡ *3*	1−	0.0051 ps *5*	90b *10*	B(E1)↑=6.1×10^{-05} *7* $T_{1/2}$: from $\Gamma^2_{\gamma 0}/\Gamma_\gamma$.
3697.4‡ *5*	1	0.034 ps *6*	11.3b *17*	$T_{1/2}$: from $\Gamma^2_{\gamma 0}/\Gamma_\gamma$ and branching(3697γ)=0.85 *8* (see adopted gammas).
3710.5‡ *5*	2+@	0.054 ps *9*	6.6b *10*	$T_{1/2}$: from $\Gamma^2_{\gamma 0}/\Gamma_\gamma$ and branching(3697γ)=0.78 *7* (see adopted gammas).
4219.1 *6*	1	13.1 fs *14*	35 *4*	
4263.4 *6*	1	23 fs *4*	19 *3*	
4605.7 *6*		10.1 fs *25*	45 *11*	
4953.7 *7*	1	14 fs *3*	33 *7*	
5064.7 *7*		7.0 fs *15*	65 *14*	
5842.5 *7*	1−	1.02 fs *8*	446 *36*	B(E1)↑=6.4×10^{-5} *5*
5869.7 *8*	(1)	5.1 fs *10*	90 *18*	
5902.5 *7*	1	5.4 fs *20*	85 *31*	
5951.9 *7*	1	1.38 fs *19*	331 *46*	
5968.4 *7*	1	2.2 fs *4*	210 *37*	
6002.0 *7*	1	1.7 fs *3*	268 *41*	
6129.0 *7*	1	0.82 fs *9*	557 *59*	
6170.8 *12*	1	1.04 fs *10*	439 *43*	
6184.0 *6*	1−	0.94 fs *11*	487 *57*	B(E1)↑=5.9×10^{-5} *7*
6236.5 *7*	1	0.64 fs *6*	711 *65*	
6287.1 *7*	1	1.52 fs *24*	301 *48*	
6321.6 *7*	1−	0.70 fs *6*	654 *59*	B(E1)↑=7.4×10^{-5} *7*
6369.1 *7*	1−	0.277 fs *16*	1650 *95*	B(E1)↑=18.2×10^{-5} *11*
6453.1 *7*	1	1.30 fs *16*	350 *44*	
6467.5 *6*	1	0.95 fs *9*	478 *44*	
6503.2 *6*	1	1.26 fs *20*	363 *59*	
6524.0 *5*	1−	0.56 fs *6*	808 *92*	B(E1)↑=8.3×10^{-5} *9*
6548.5 *5*	1	0.65 fs *7*	699 *74*	
6560.8 *7*	1−	0.35 fs *3*	1.30×10^3 *12*	B(E1)↑=13.1×10^{-5} *12*

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^{124}Sn(γ,γ′),(pol γ,γ′) 1998Go07 (continued)

^{124}Sn Levels (continued)

E(level)†	Jπ#	$T_{1/2}$&	$\Gamma^2_{\gamma 0}/\Gamma_\gamma$a	Comments
6565.8 *8*	1	0.85 fs *11*	534 *67*	
6584.1 *6*	1−	0.75 fs *8*	605 *64*	B(E1)↑=6.0×10^{-5} *6*
6599.8 *7*	1	1.4 fs *3*	335 *76*	
6635.6 *6*	1−	0.39 fs *3*	1171 *88*	B(E1)↑=11.4×10^{-5} *9*
6677.9 *7*	1−	0.42 fs *3*	1083 *89*	B(E1)↑=10.4×10^{-5} *9*
6683.3 *8*	1−	0.71 fs *9*	639 *85*	B(E1)↑=6.1×10^{-5} *8*
6705.4 *8*	1−	0.97 fs *14*	471 *66*	B(E1)↑=4.5×10^{-5} *6*
6713.6 *7*	1−	0.52 fs *5*	883 *86*	B(E1)↑=8.3×10^{-5} *8*
6722.3 *6*	1	0.66 fs *7*	693 *75*	
6764.2 *8*	1−	0.58 fs *7*	781 *99*	B(E1)↑=7.2×10^{-5} *9*
6775.6 *8*	1	0.84 fs *15*	541 *96*	
6790.6 *8*	1−	0.71 fs *8*	639 *76*	B(E1)↑=5.8×10^{-5} *7*
6808.0 *6*	1(+)	1.08 fs *14*	422 *56*	B(M1)↑=0.35 *5*
6847.1 *8*	1−	0.90 fs *10*	508 *57*	B(E1)↑=4.5×10^{-5} *5*
6902.1 *8*	1−	1.13 fs *14*	404 *50*	B(E1)↑=3.5×10^{-5} *4*
6928.2 *8*	(1)	1.4 fs *4*	320 *83*	
6938.9 *8*	1	1.6 fs *3*	283 *54*	
6947.5 *8*	1	1.6 fs *3*	288 *55*	
7018.0 *8*	1	1.07 fs *13*	427 *52*	
7032.5 *7*	1−	0.97 fs *11*	472 *52*	B(E1)↑=3.9×10^{-5} *4*
7062.2 *9*	1	2.6 fs *6*	176 *43*	
7071.1 *8*	1	1.31 fs *18*	347 *48*	
7086.5 *7*	1	1.46 fs *25*	313 *53*	
7125.7 *7*	1	1.22 fs *17*	374 *53*	
7233.8 *8*	1	1.8 fs *5*	249 *68*	
7258.6 *10*	1	1.7 fs *5*	270 *85*	
7295.5 *7*	1−	0.63 fs *5*	720 *55*	B(E1)↑=5.3×10^{-5} *4*
7308.5 *9*	1	1.7 fs *4*	268 *65*	
7326.2 *7*	1	1.7 fs *4*	269 *66*	
7337.5 *7*	1−	0.76 fs *11*	597 *89*	B(E1)↑=4.3×10^{-5} *6*
7344.4 *7*	1	1.06 fs *21*	430 *84*	
7394.5 *4*	1−	0.93 fs *15*	488 *79*	B(E1)↑=3.5×10^{-5} *6*
7487.6 *7*	1−	0.72 fs *9*	633 *82*	B(E1)↑=4.3×10^{-5} *6*
7536.5 *7*	1−	0.70 fs *11*	6.5×10^2 *10*	B(E1)↑=4.4×10^{-5} *7*
7550.9 *6*	1−	0.83 fs *12*	548 *81*	B(E1)↑=3.6×10^{-5} *5*
7566.9 *10*	1	1.33 fs *18*	342 *45*	
7575.9 *7*	1−	0.96 fs *12*	476 *60*	B(E1)↑=3.1×10^{-5} *4*
7596.4 *10*	1−	0.64 fs *6*	716 *66*	B(E1)↑=4.7×10^{-5} *4*
7603.7 *8*	1−	0.59 fs *8*	7.7×10^2 *10*	B(E1)↑=5.0×10^{-5} *7*
7642.6 *8*	1−	1.22 fs *24*	374 *73*	B(E1)↑=2.4×10^{-5} *5*
7666.0 *7*	1	1.9 fs *3*	241 *41*	
7678.8 *14*	1	1.7 fs *4*	274 *58*	
7683.9 *11*	1−	0.92 fs *17*	496 *91*	B(E1)↑=3.1×10^{-5} *6*
7691.2 *7*	1	1.08 fs *18*	424 *72*	
7702.6 *9*	1	2.2 fs *5*	212 *50*	
7747.4 *7*	1−	0.76 fs *8*	598 *63*	B(E1)↑=3.7×10^{-5} *4*
7759.1 *4*	1−	0.62 fs *6*	741 *68*	B(E1)↑=4.5×10^{-5} *4*
7770.6 *6*	1	1.09 fs *20*	420 *79*	
7778.1 *9*	1	1.6 fs *3*	294 *63*	
7788.3 *5*	1	0.78 fs *9*	582 *66*	
7815.3 *5*	1−	0.345 fs *25*	1321 *95*	B(E1)↑=7.9×10^{-5} *6*
7863.4 *8*	1−	0.90 fs *11*	506 *64*	B(E1)↑=3.0×10^{-5} *4*
7872.1 *6*	1	0.78 fs *12*	582 *89*	
7880.2 *5*	1−	0.39 fs *3*	1181 *80*	B(E1)↑=6.9×10^{-5} *5*
7905.1 *12*	1	1.6 fs *3*	294 *62*	

^{124}Sn(γ,γ'),(pol γ,γ') 1998Go07 (continued)

^{124}Sn Levels (continued)

E(level)†	J^{π}#	$T_{1/2}$&	$\Gamma^2_{\gamma 0}/\Gamma_{\gamma}$ a	Comments
7913.1 *8*	1	1.03 fs *21*	442 *89*	

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^{124}Sn(γ,γ′),(pol γ,γ′) 1998Go07 (continued)

^{124}Sn Levels (continued)

E(level)†	Jπ#	$T_{1/2}$&	$\Gamma^2_{\gamma 0}/\Gamma_\gamma$a	Comments
7939.0 *12*	1	1.6 fs *3*	282 *46*	
7957.1 *9*	1	0.53 fs *3*	857 *56*	
7998.9 *9*	1^-	0.90 fs *12*	506 *68*	B(E1)↑=2.8×10^{-5} *4*
8111.8 *16*	1	1.22 fs *18*	375 *56*	
8118.8 *8*	1	0.55 fs *4*	827 *65*	
8131.7 *15*	1	0.64 fs *6*	716 *67*	
8162.2 *8*	1	1.17 fs *16*	390 *54*	
8214.3 *12*	1	1.6 fs *3*	291 *63*	
8228.9 *6*	1	0.72 fs *8*	632 *72*	
8256.9 *9*	1	1.43 fs *18*	319 *40*	
8269.8 *7*	$1^{(+)}$	0.81 fs *6*	564 *45*	B(M1)↑=0.26 *2*
8350.1 *13*	1	1.44 fs *19*	316 *42*	
8376.2 *11*	1^-	0.78 fs *7*	586 *51*	B(E1)↑=2.9×10^{-5} *2*
8422.8 *7*	1	0.92 fs *9*	495 *51*	
8433.2 *10*	1	1.08 fs *13*	424 *53*	

† From 1998Go07, unless otherwise indicated.
‡ From 2005Br05.
# From γ′(90°)/γ′(127°) and linear polarization, unless otherwise indicated.
@ From Adopted Levels.
& From $\Gamma^2_{\gamma 0}/\Gamma_\gamma$ and branching ratios, unless otherwise indicated. For levels above 3710 keV, half-lives were obtained under the assumption of $\Gamma_0=\Gamma$ as: $T_{1/2}$ (in fs) = 0.4562 (1/Γ in eV).
a In meV, from 1998Go07, unless otherwise indicated.
b From 2005Br05.

γ(^{124}Sn)

E(A),M(B) From 1994Go25.

E_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡	E_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡
1131.8 *4*	1131.8	2^+	0.0	0^+	Q#	6170.8 *12*	6170.8	1	0.0	0^+	D
2426.5 *5*	2426.5	2^+	0.0	0^+	(Q)#	6184.0 *6*	6184.0	1^-	0.0	0^+	E1
3214.8 *4*	3214.8	2^+	0.0	0^+	Q#	6236.5 *7*	6236.5	1	0.0	0^+	D
3490.1 *3*	3490.1	1^-	0.0	0^+	E1#	6287.1 *7*	6287.1	1	0.0	0^+	D
3697.4 *5*	3697.4	1	0.0	0^+	D#	6321.6 *7*	6321.6	1^-	0.0	0^+	E1
3710.5 *5*	3710.5	2^+	0.0	0^+	(Q)#	6369.1 *7*	6369.1	1^-	0.0	0^+	E1
4219.1 *6*	4219.1	1	0.0	0^+	D	6453.1 *7*	6453.1	1	0.0	0^+	D
4263.4 *6*	4263.4	1	0.0	0^+	D	6467.5 *6*	6467.5	1	0.0	0^+	D
4605.7 *6*	4605.7		0.0	0^+		6503.2 *6*	6503.2	1	0.0	0^+	D
4953.7 *7*	4953.7	1	0.0	0^+	D	6524.0 *5*	6524.0	1^-	0.0	0^+	E1
5064.7 *7*	5064.7		0.0	0^+		6548.5 *5*	6548.5	1	0.0	0^+	D
5842.5 *7*	5842.5	1^-	0.0	0^+	E1	6560.8 *7*	6560.8	1^-	0.0	0^+	E1
5869.7 *8*	5869.7	(1)	0.0	0^+	(D)	6565.8 *8*	6565.8	1	0.0	0^+	D
5902.5 *7*	5902.5	1	0.0	0^+	D	6584.1 *6*	6584.1	1^-	0.0	0^+	E1
5951.7 *7*	5951.9	1	0.0	0^+	D	6599.8 *7*	6599.8	1	0.0	0^+	D
5968.4 *7*	5968.4	1	0.0	0^+	D	6635.6 *6*	6635.6	1^-	0.0	0^+	E1
6002.0 *7*	6002.0	1	0.0	0^+	D	6677.9 *7*	6677.9	1^-	0.0	0^+	E1
6129.0 *7*	6129.0	1	0.0	0^+	D	6683.3 *8*	6683.3	1^-	0.0	0^+	E1

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^{124}Sn(γ,γ′),(pol γ,γ′) 1998Go07 (continued)

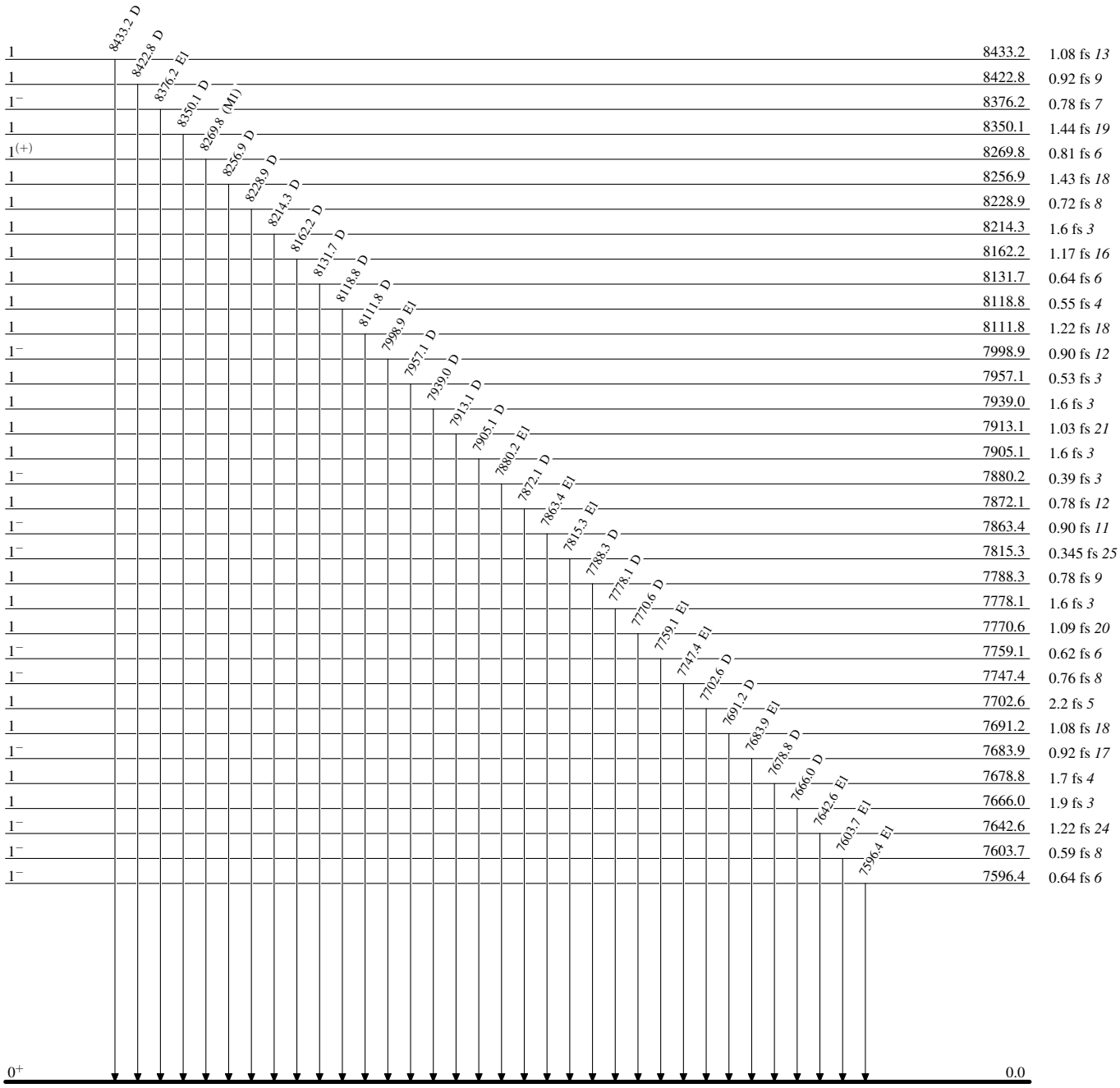
γ(^{124}Sn) (continued)

E_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	E_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡
6705.4 *8*	6705.4	1^-	0.0	0^+	E1	7642.6 *8*	7642.6	1^-	0.0	0^+	E1
6713.6 *7*	6713.6	1^-	0.0	0^+	E1	7666.0 *7*	7666.0	1	0.0	0^+	D
6722.3 *6*	6722.3	1	0.0	0^+	D	7678.8 *14*	7678.8	1	0.0	0^+	D
6764.2 *8*	6764.2	1^-	0.0	0^+	E1	7683.9 *11*	7683.9	1^-	0.0	0^+	E1
6775.6 *8*	6775.6	1	0.0	0^+	D	7691.2 *7*	7691.2	1	0.0	0^+	D
6790.6 *8*	6790.6	1^-	0.0	0^+	E1	7702.6 *9*	7702.6	1	0.0	0^+	D
6808.0 *6*	6808.0	$1^{(+)}$	0.0	0^+	(M1)	7747.4 *7*	7747.4	1^-	0.0	0^+	E1
6847.1 *8*	6847.1	1^-	0.0	0^+	E1	7759.1 *4*	7759.1	1^-	0.0	0^+	E1
6902.1 *8*	6902.1	1^-	0.0	0^+	E1	7770.6 *6*	7770.6	1	0.0	0^+	D
6928.2 *8*	6928.2	(1)	0.0	0^+	(D)	7778.1 *9*	7778.1	1	0.0	0^+	D
6938.9 *8*	6938.9	1	0.0	0^+	D	7788.3 *5*	7788.3	1	0.0	0^+	D
6947.5 *8*	6947.5	1	0.0	0^+	D	7815.3 *5*	7815.3	1^-	0.0	0^+	E1
7018.0 *8*	7018.0	1	0.0	0^+	D	7863.4 *8*	7863.4	1^-	0.0	0^+	E1
7032.5 *7*	7032.5	1^-	0.0	0^+	E1	7872.1 *6*	7872.1	1	0.0	0^+	D
7062.2 *9*	7062.2	1	0.0	0^+	D	7880.2 *5*	7880.2	1^-	0.0	0^+	E1
7071.1 *8*	7071.1	1	0.0	0^+	D	7905.1 *12*	7905.1	1	0.0	0^+	D
7086.5 *7*	7086.5	1	0.0	0^+	D	7913.1 *8*	7913.1	1	0.0	0^+	D
7125.7 *7*	7125.7	1	0.0	0^+	D	7939.0 *12*	7939.0	1	0.0	0^+	D
7233.8 *8*	7233.8	1	0.0	0^+	D	7957.1 *9*	7957.1	1	0.0	0^+	D
7258.6 *10*	7258.6	1	0.0	0^+	D	7998.9 *9*	7998.9	1^-	0.0	0^+	E1
7295.5 *7*	7295.5	1^-	0.0	0^+	E1	8111.8 *16*	8111.8	1	0.0	0^+	D
7308.5 *9*	7308.5	1	0.0	0^+	D	8118.8 *8*	8118.8	1	0.0	0^+	D
7326.2 *7*	7326.2	1	0.0	0^+	D	8131.7 *15*	8131.7	1	0.0	0^+	D
7337.5 *7*	7337.5	1^-	0.0	0^+	E1	8162.2 *8*	8162.2	1	0.0	0^+	D
7344.4 *7*	7344.4	1	0.0	0^+	D	8214.3 *12*	8214.3	1	0.0	0^+	D
7394.5 *4*	7394.5	1^-	0.0	0^+	E1	8228.9 *6*	8228.9	1	0.0	0^+	D
7487.6 *7*	7487.6	1^-	0.0	0^+	E1	8256.9 *9*	8256.9	1	0.0	0^+	D
7536.5 *7*	7536.5	1^-	0.0	0^+	E1	8269.8 *7*	8269.8	$1^{(+)}$	0.0	0^+	(M1)
7550.9 *6*	7550.9	1^-	0.0	0^+	E1	8350.1 *13*	8350.1	1	0.0	0^+	D
7566.9 *10*	7566.9	1	0.0	0^+	D	8376.2 *11*	8376.2	1^-	0.0	0^+	E1
7575.9 *7*	7575.9	1^-	0.0	0^+	E1	8422.8 *7*	8422.8	1	0.0	0^+	D
7596.4 *10*	7596.4	1^-	0.0	0^+	E1	8433.2 *10*	8433.2	1	0.0	0^+	D
7603.7 *8*	7603.7	1^-	0.0	0^+	E1						

† From 1998Go07, unless otherwise indicated.
‡ From the assignment in 1998Go07, which deduced from the measurements of γ′(90°)/γ′(127°) and polarization asymmetry, unless otherwise indicated.
# From γ′(90°)/γ′(127°) and asymmetry measured by 1994Go25.

^{124}Sn(γ,γ′),(pol γ,γ′) 1998Go07

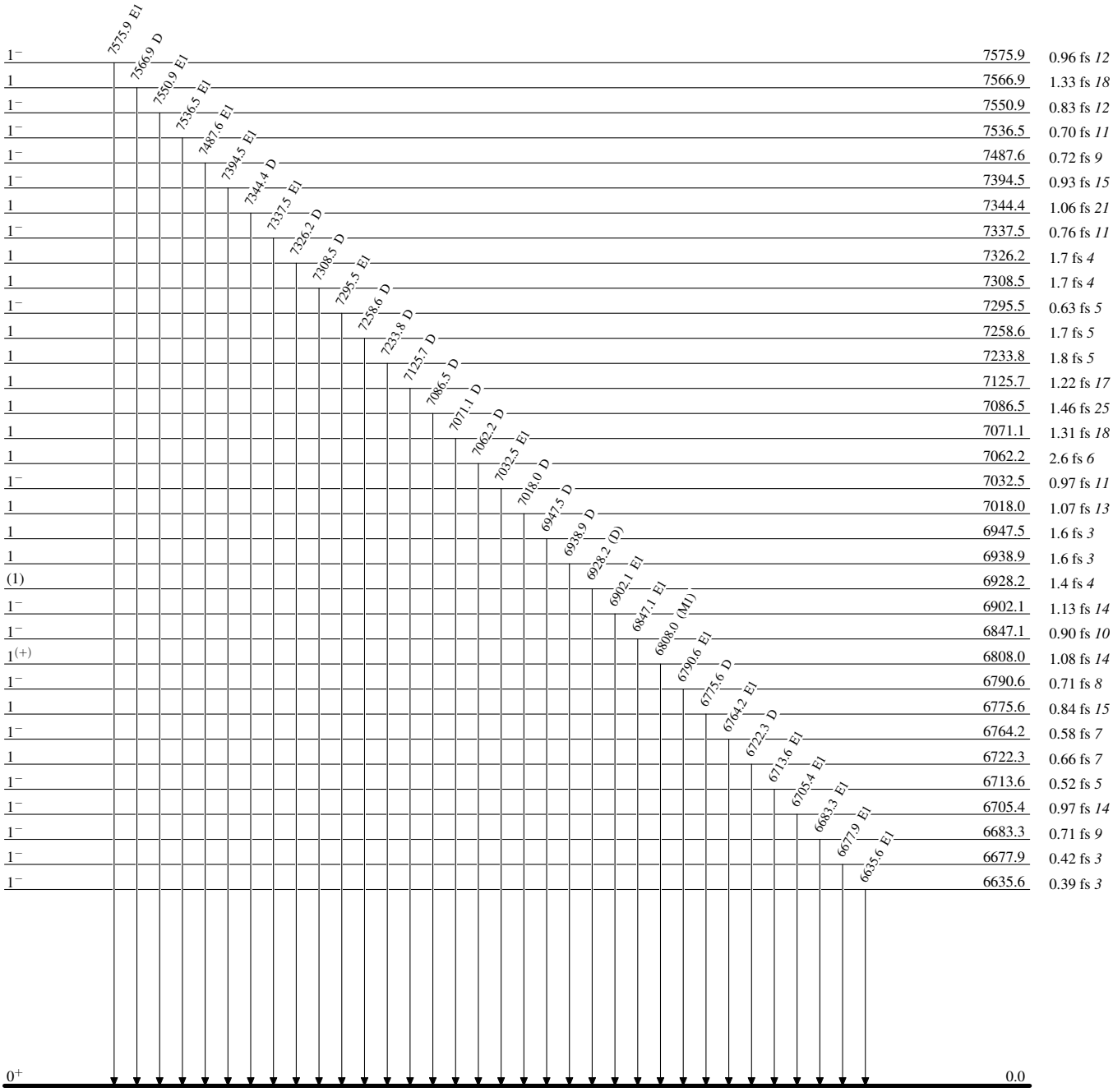
Level Scheme



$^{124}_{50}Sn_{74}$

^{124}Sn(γ,γ′),(pol γ,γ′) 1998Go07

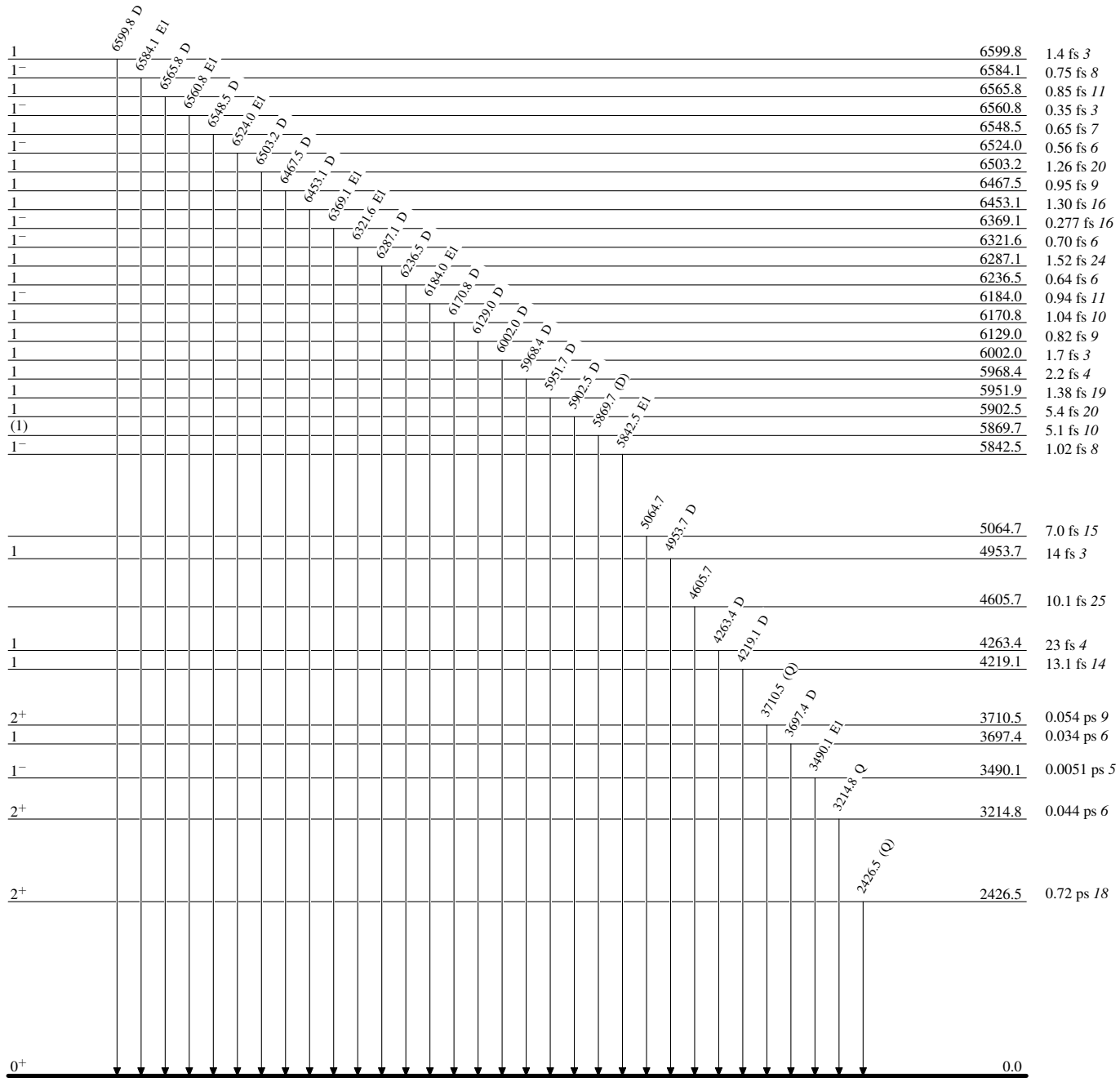
Level Scheme (continued)



$^{124}_{50}Sn_{74}$

^{124}Sn(γ,γ′),(pol γ,γ′) 1998Go07

Level Scheme (continued)



$^{124}_{50}Sn_{74}$