^{58}Ni(^{64}Zn,αpγ) 2001Sm01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	ENSDF	1-Mar-2009

^{58}Ni(^{64}Zn,αpγ) E=265 MeV and ^{64}Zn(^{58}Ni,αpγ) E=230 and 240 MeV. Measured Eγ, Iγ, $\gamma\gamma$ and $\gamma\gamma(\theta)$ using Gammasphere array consisting of 56, 75% efficient, escape-suppressed Ge detectors.

^{117}Cs Levels

E(level)[†]	J$^\pi$[‡]	Comments
0+x[#]	11/2$^-$	
0+y[@]	(3/2$^+$)	
0+z[&]	(9/2$^+$)	E(level): Z=0.0 (1986Ma41).
195.2+y[@] *3*	(7/2$^+$)	
231.1+z[a] *2*	(11/2$^+$)	
306.1+x[#] *3*	(15/2$^-$)	
489.4+z[&] *2*	(13/2$^+$)	
630.8+y[@] *5*	(11/2$^+$)	
772.2+z[a] *3*	(15/2$^+$)	
800.9+x[#] *5*	(19/2$^-$)	
1077.9+z[&] *3*	(17/2$^+$)	
1187.3+y[@] *6*	(15/2$^+$)	
1404.3+z[a] *4*	19/2$^+$	
1427.8+x[#] *6*	(23/2$^-$)	
1747.0+z[&] *4*	(21/2$^+$)	
1753.4+y[@] *6*	(19/2$^+$)	
2104.6+z[a] *4*	(23/2$^+$)	
2150.6+x[#] *6*	(27/2$^-$)	
2303.0+y[@] *7*	(23/2$^+$)	
2473.7+z[&] *5*	(25/2$^+$)	
2852.1+z[a] *5*	(27/2$^+$)	
2919.3+y[@] *8*	(27/2$^+$)	
2946.3+x[#] *7*	(31/2$^-$)	
3238.6+z[&] *5*	(29/2$^+$)	
3631.5+y[@] *8*	(31/2$^+$)	
3635.2+z[a] *5*	(31/2$^+$)	
3785.5+x[#] *8*	35/2$^-$	
4043.7+z[&] *5*	(33/2$^+$)	
4121+x *1*	(35/2$^-$)	
4436.3+y[@] *9*	(35/2$^+$)	
4465.2+z[a] *5*	(35/2$^+$)	
4654.6+x[#] *8*	39/2$^-$	
4904.4+z[&] *6*	(37/2$^+$)	
5230+x *2*	(39/2$^-$)	
5318.1+y[@] *9*	(39/2$^+$)	
5336.8+z[a] *6*	(39/2$^+$)	
5600.5+x[#] *9*	43/2$^-$	
5806+z[&] *6*	(41/2$^+$)	
6245.9+y[@] *10*	(43/2$^+$)	

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^{58}Ni(^{64}Zn,αpγ) 2001Sm01 (continued)

^{117}Cs Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
6258+z?[a]	(43/2+)	7768.1+x[#] *10*	(51/2−)	11633+x[#] *2*	(63/2−)
6638.9+x[#] *9*	47/2−	8266.9+y[@] *11*	(51/2+)	12982+x?[#] *2*	(67/2−)
6800.8+z?[&] *7*	(45/2+)	8993.0+x[#] *10*	(55/2−)	14396+x?[#] *2*	(71/2−)
7232.4+z?[a] *7*	(47/2+)	9391.2+y?[@] *11*	(55/2+)		
7239.3+y[@] *10*	(47/2+)	10283.2+x[#] *11*	(59/2−)		

† From least-squares fit to Eγ′s. From systematics, 9/2+ g.s. and a 3/2+ isomer at 150 *100* keV are expected (see 2003Au03). It is possible that 0+z corresponds to g.s. and 0+y to 3/2+ isomer. z=0, y=150 are adopted in Adopted Levels by the evaluator.

‡ As given by the authors.

[#] Band(A): $\pi h_{11/2}$, 1/2[550] band, $\alpha=-1/2$. The first upbend is attributed to $\nu h^2_{11/2}$. Observation of only one signature indicates large signature splitting.

[@] Band(B): $\pi g_{7/2}/\pi d_{5/2}$, 3/2[422] or 1/2[420], $\alpha=-1/2$. The first upbend is attributed to $\pi h^2_{11/2}$ and the second to $\nu h^2_{11/2}$. Observation of only one signature indicates large signature splitting.

[&] Band(C): π9/2[404] band, $\alpha=+1/2$. The first upbend is attributed to $\pi h^2_{11/2}$ and the second to $\nu h^2_{11/2}$.

[a] Band(c): π9/2[404] band, $\alpha=-1/2$. See also comment for its signature partner.

γ(^{117}Cs)

R(ang)=Iγ(50°,130°)/Iγ(90°). Value of 0.7 for this indicates ΔJ=1, dipole and 1.3 indicates ΔJ=2, quadrupole.

E_γ†	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	Comments
195.2 *3*	53 *2*	195.2+y	(7/2+)	0+y	(3/2+)	E2	R(ang)=1.16 *12*.
230.8 *3*	75 *5*	231.1+z	(11/2+)	0+z	(9/2+)	M1,E2	R(ang)=0.87 *9*.
257.8 *3*	66 *5*	489.4+z	(13/2+)	231.1+z	(11/2+)	M1,E2	R(ang)=0.93 *9*.
283.1 *3*	53 *4*	772.2+z	(15/2+)	489.4+z	(13/2+)	M1,E2	R(ang)=0.92 *9*.
305.8 *3*	40 *15*	1077.9+z	(17/2+)	772.2+z	(15/2+)	M1,E2	R(ang)=0.95 *10*.
306.1 *3*	130 *16*	306.1+x	(15/2−)	0+x	11/2−	E2	R(ang)=1.25 *11*.
326.1 *3*	32 *2*	1404.3+z	19/2+	1077.9+z	(17/2+)	M1,E2	R(ang)=0.77 *8*.
343.2 *3*	27 *2*	1747.0+z	(21/2+)	1404.3+z	19/2+	M1,E2	R(ang)=0.90 *9*.
357.5 *3*	28 *2*	2104.6+z	(23/2+)	1747.0+z	(21/2+)	M1,E2	R(ang)=0.85 *9*.
368.7 *3*	19 *1*	2473.7+z	(25/2+)	2104.6+z	(23/2+)	M1,E2	R(ang)=0.98 *11*.
378.5 *3*	15 *1*	2852.1+z	(27/2+)	2473.7+z	(25/2+)	M1,E2	R(ang)=0.69 *8*.
385.9 *3*	14 *1*	3238.6+z	(29/2+)	2852.1+z	(27/2+)	M1,E2	R(ang)=0.85 *10*.
396.5 *3*	11 *1*	3635.2+z	(31/2+)	3238.6+z	(29/2+)	M1,E2[@]	
408.8 *3*	8 *2*	4043.7+z	(33/2+)	3635.2+z	(31/2+)	M1,E2[@]	
421.7 *3*	4 *3*	4465.2+z	(35/2+)	4043.7+z	(33/2+)	M1,E2	R(ang)=0.74 *9*.
433.2 *3*	2 *1*	5336.8+z	(39/2+)	4904.4+z	(37/2+)	M1,E2	R(ang)=0.78 *9*.
435.6 *3*	31 *1*	630.8+y	(11/2+)	195.2+y	(7/2+)	E2	R(ang)=1.29 *13*.
440.2 *3*	6 *2*	4904.4+z	(37/2+)	4465.2+z	(35/2+)	M1,E2[@]	
489.7 *3*	17 *1*	489.4+z	(13/2+)	0+z	(9/2+)	E2[&]	
494.8 *3*	125 *20*	800.9+x	(19/2−)	306.1+x	(15/2−)	E2	R(ang)=1.23 *11*.
541.2 *3*	13 *1*	772.2+z	(15/2+)	231.1+z	(11/2+)	E2	R(ang)=1.53 *17*.
549.6 *3*	18 *1*	2303.0+y	(23/2+)	1753.4+y	(19/2+)	E2	R(ang)=1.15 *12*.
556.5 *3*	28 *1*	1187.3+y	(15/2+)	630.8+y	(11/2+)	E2	R(ang)=1.04 *10*.
566.1 *3*	26 *1*	1753.4+y	(19/2+)	1187.3+y	(15/2+)	E2	R(ang)=1.20 *12*.
588.2 *3*	25 *2*	1077.9+z	(17/2+)	489.4+z	(13/2+)	E2	R(ang)=1.63 *18*.
616.3 *3*	14 *1*	2919.3+y	(27/2+)	2303.0+y	(23/2+)	E2	R(ang)=1.44 *18*.

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^{58}Ni(^{64}Zn,αpγ) 2001Sm01 (continued)

γ(^{117}Cs) (continued)

E_γ[†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
626.9 *3*	122 *7*	1427.8+x	(23/2$^-$)	800.9+x	(19/2$^-$)	E2	R(ang)=1.34 *12*.
632.3 *3*	32 *2*	1404.3+z	19/2$^+$	772.2+z	(15/2$^+$)	E2	R(ang)=1.49 *20*.
669.2 *3*	26 *2*	1747.0+z	(21/2$^+$)	1077.9+z	(17/2$^+$)	E2	R(ang)=1.52 *17*.
699.7 *3*	26 *2*	2104.6+z	(23/2$^+$)	1404.3+z	19/2$^+$	E2	R(ang)=1.32 *15*.
712.2 *3*	11 *1*	3631.5+y	(31/2$^+$)	2919.3+y	(27/2$^+$)	E2[&]	
722.8 *3*	115 *6*	2150.6+x	(27/2$^-$)	1427.8+x	(23/2$^-$)	E2	R(ang)=1.57 *15*.
727.2 *3*	31 *2*	2473.7+z	(25/2$^+$)	1747.0+z	(21/2$^+$)	E2[&]	
747.4 *3*	29 *2*	2852.1+z	(27/2$^+$)	2104.6+z	(23/2$^+$)	E2[&]	
765.1 *3*	22 *2*	3238.6+z	(29/2$^+$)	2473.7+z	(25/2$^+$)	E2	R(ang)=1.52 *17*.
783.5 *3*	25 *2*	3635.2+z	(31/2$^+$)	2852.1+z	(27/2$^+$)	E2[&]	
795.7 *3*	77 *4*	2946.3+x	(31/2$^-$)	2150.6+x	(27/2$^-$)	E2	R(ang)=1.47 *14*.
804.8 *3*	23 *2*	4043.7+z	(33/2$^+$)	3238.6+z	(29/2$^+$)	E2[&]	
804.8 *3*	10 *1*	4436.3+y	(35/2$^+$)	3631.5+y	(31/2$^+$)	E2[&]	
829.9 *3*	22 *6*	4465.2+z	(35/2$^+$)	3635.2+z	(31/2$^+$)	E2[&]	
839.2 *3*	71 *4*	3785.5+x	35/2$^-$	2946.3+x	(31/2$^-$)	E2	R(ang)=1.21 *11*.
860.5 *3*	17 *2*	4904.4+z	(37/2$^+$)	4043.7+z	(33/2$^+$)	E2[&]	
869.1 *3*	50 *3*	4654.6+x	39/2$^-$	3785.5+x	35/2$^-$	E2	R(ang)=1.44 *14*.
870.9 *3*	20 *2*	5336.8+z	(39/2$^+$)	4465.2+z	(35/2$^+$)	E2[&]	
881.8 *3*	8 *1*	5318.1+y	(39/2$^+$)	4436.3+y	(35/2$^+$)	E2[&]	
902.2[a] *3*	13 *1*	5806+z	(41/2$^+$)	4904.4+z	(37/2$^+$)	E2[&]	
920.8[a] *3*	15 *1*	6258+z?	(43/2$^+$)	5336.8+z	(39/2$^+$)	E2[&]	
927.8 *3*	5 *1*	6245.9+y	(43/2$^+$)	5318.1+y	(39/2$^+$)	E2[&]	
945.9 *3*	37 *2*	5600.5+x	43/2$^-$	4654.6+x	39/2$^-$	E2	R(ang)=1.24 *13*.
974.8[a] *3*	8 *1*	7232.4+z?	(47/2$^+$)	6258+z?	(43/2$^+$)	E2[&]	
993.4 *3*	4 *1*	7239.3+y	(47/2$^+$)	6245.9+y	(43/2$^+$)	E2[&]	
994.2[a] *3*	10 *3*	6800.8+z?	(45/2$^+$)	5806+z	(41/2$^+$)	E2[&]	
1027.6 *3*	1 *1*	8266.9+y	(51/2$^+$)	7239.3+y	(47/2$^+$)		
1038.4 *3*	24 *2*	6638.9+x	47/2$^-$	5600.5+x	43/2$^-$	E2	R(ang)=1.34 *15*.
1109[‡]		5230+x	(39/2$^-$)	4121+x	(35/2$^-$)	E2	
1124.3[a] *3*	1 *1*	9391.2+y?	(55/2$^+$)	8266.9+y	(51/2$^+$)		
1129.2 *3*	20 *2*	7768.1+x	(51/2$^-$)	6638.9+x	47/2$^-$	E2[&]	
1175[‡]		4121+x	(35/2$^-$)	2946.3+x	(31/2$^-$)	E2	
1224.9 *3*	18 *2*	8993.0+x	(55/2$^-$)	7768.1+x	(51/2$^-$)	E2[&]	
1290.1 *3*	11 *1*	10283.2+x	(59/2$^-$)	8993.0+x	(55/2$^-$)	E2[&]	
1349[a] *1*	8[#] *4*	12982+x?	(67/2$^-$)	11633+x	(63/2$^-$)	E2	
1350 *1*	10[#] *4*	11633+x	(63/2$^-$)	10283.2+x	(59/2$^-$)	E2	
1413.9[a] *3*	4 *1*	14396+x?	(71/2$^-$)	12982+x?	(67/2$^-$)	E2[&]	

[†] Uncertainty is stated by 2001Sm01 as 0.2 or 0.3 keV. The evaluator assign 0.3 keV for all Eγ's, except 1 keV where Eγ is quoted to nearest keV.
[‡] Estimated value, Eγ not measured.
[#] Estimated value, Iγ not measured.
[@] Authors state that mult=M1,E2 but give no R value.
[&] Authors state that mult=E2 but give no R value.
[a] Placement of transition in the level scheme is uncertain.

^{58}Ni(^{64}Zn,αpγ) 2001Sm01

Level Scheme

Intensities: Relative I_γ

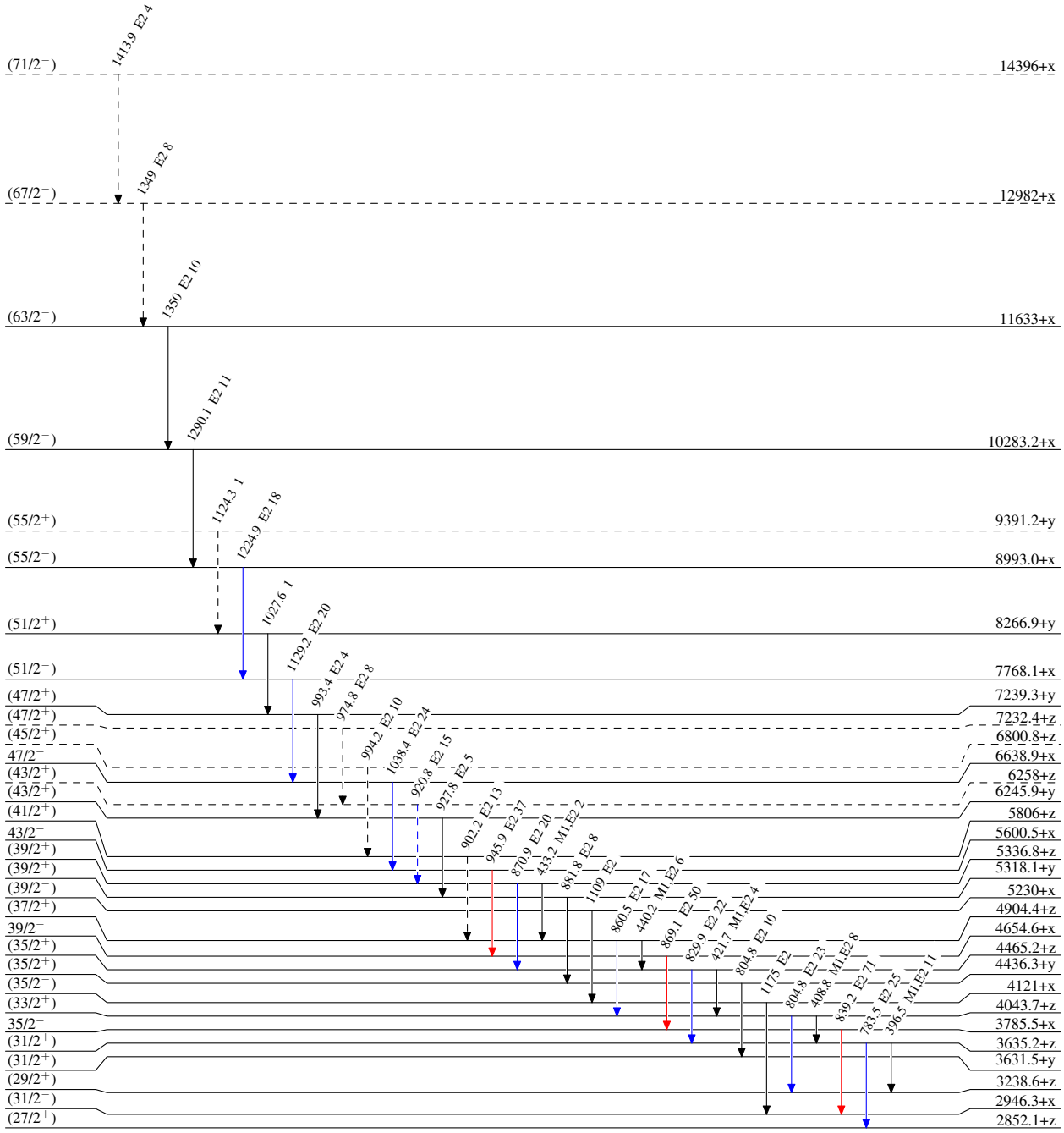
Legend

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

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

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

γ Decay (Uncertain)



$^{117}_{55}Cs_{62}$

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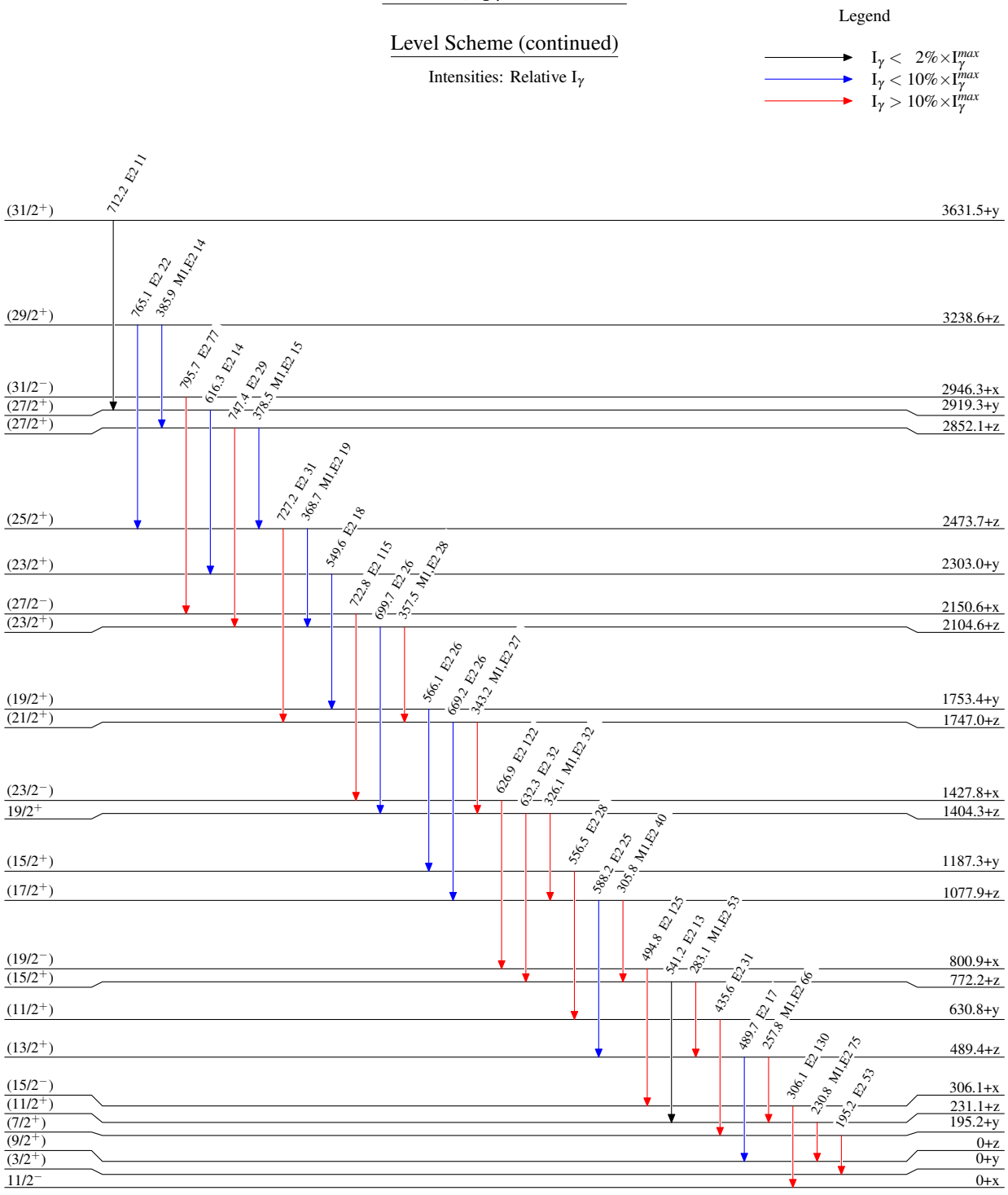
Level Scheme (continued)

Intensities: Relative I_γ



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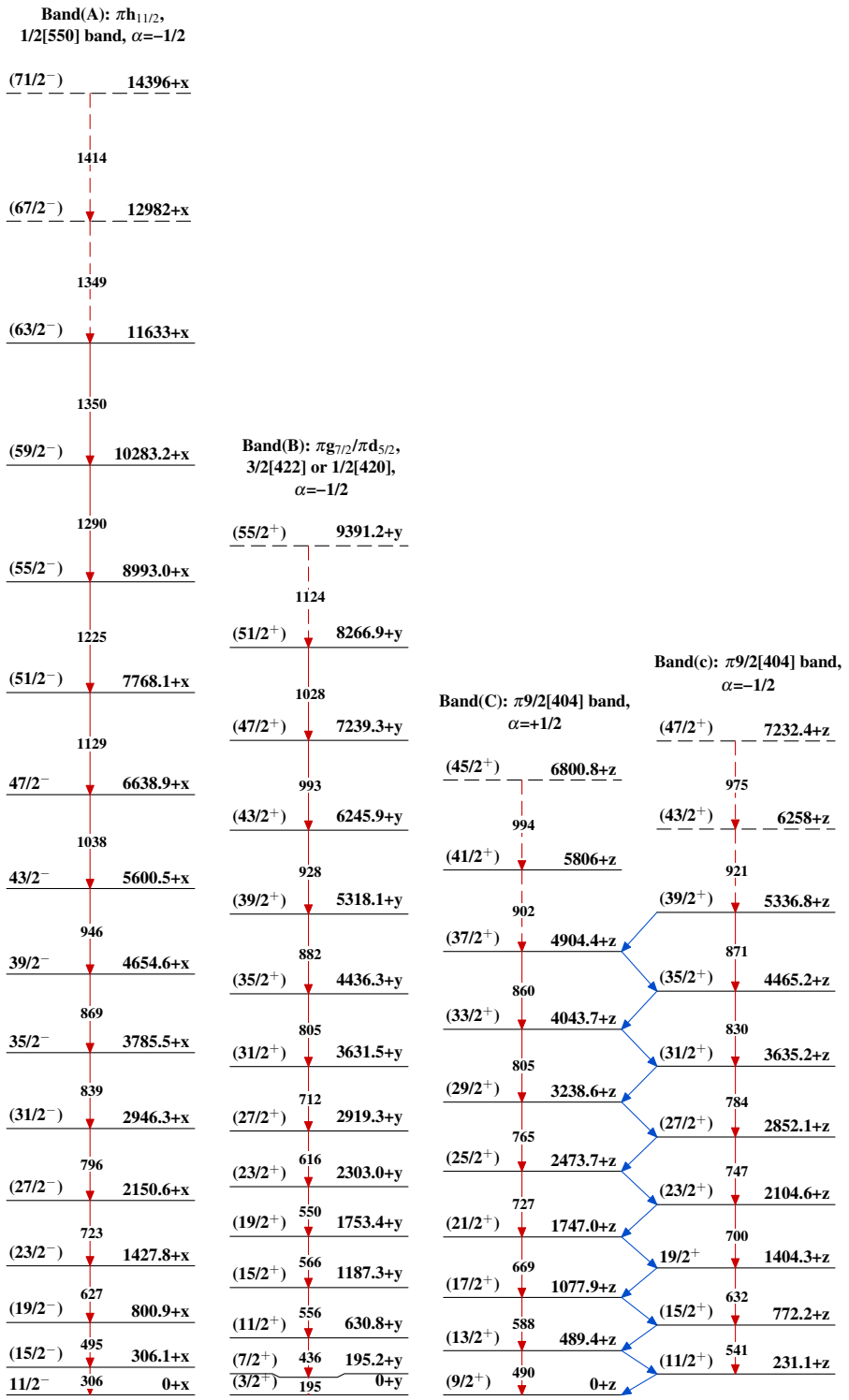

$^{117}_{55}Cs_{62}$