^{58}Ni(^{58}Ni,2αpγ) 2000La27

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 109, 1383 (2008)	1-Mar-2008

2000La27: ^{58}Ni(^{58}Ni,2αpγ) E=250 MeV.
Measured Eγ, Iγ, γγ and γγ(θ)(DCO) using GAMMASPHERE array consisting of 83 high purity Compton-suppressed Ge detectors, and MICROBALL 4π array of 95 CsI(T1) scintillators was used to detect protons and α particles.
1994Se01: ^{54}Fe(^{58}Ni,xnγ) E=270 MeV.
Measured γ, "NORDBALL"; excit, γ(θ), 20 Compton-suppressed Ge 52 BaF2 as multiplicity filter.
The level scheme is from 2000La27.

^{107}Sb Levels

E(level)‡	Jπ
0.0#	5/2+
768.62†@ *16*	7/2+
1058.28†# *15*	9/2+
1388.97& *15*	9/2+
1605.37b *21*	11/2−
1790.45†@ *17*	11/2+
1872.42 *21*	
1900.06†# *18*	13/2+
2163.87& *19*	13/2+
2239.54†@ *20*	15/2+
2535.40†& *23*	17/2+
2621.29b *23*	15/2−
2745.65†# *22*	17/2+
2878.6 *3*	
3306.73# *23*	
3377.68†@ *24*	19/2+
3482.4 *3*	
3487.11b *24*	19/2−
3551.21† *25*	
3661.5†& *3*	21/2+
3732.6 *4*	
3779.38†b *23*	21/2−
3936.6 *3*	
4100.3†b *3*	23/2−
4215.5@ *3*	
4234.7& *4*	
4306.6 *3*	
4442.7 *3*	
4607.7a *3*	25/2−
4889.4& *4*	
5089.8 *3*	
5131.1 *3*	
5208.1b *4*	27/2−
5674.4a *4*	29/2−
5768.9 *4*	
5967.6b *4*	31/2−
6097.7 *4*	

Continued on next page (footnotes at end of table)

^{58}Ni(^{58}Ni,2αpγ) 2000La27 (continued)

^{107}Sb Levels (continued)

E(level)‡	Jπ	Comments
6379.6[a] 4	33/2−	
6437.9 4		
7269.1[b] 6	35/2−	
7540.8[a] 5	37/2−	
7900.6[b] 6		
8407.4[a] 5	41/2−	
9863.5[a] 7		
0.0+x		Additional information 1.
572.0+x 5		
815.6+x 8		
2041.4+x[c] 7	≥37/2	
3167.7+x[c] 7	≥41/2	
4446.1+x[c] 8	≥45/2	
5882.6+x[c] 9	≥49/2	
7434.8+x[c] 10	≥53/2	
9228.2+x[c] 13	≥57/2	
11491.2+x[c] 16	≥61/2	
14217.2+x[c] 19	≥65/2	
0.0+y		Additional information 2.
328.5+y[d] 7	≥17/2	
573.1+y 3		
720.8+y[d] 7	≥19/2	
1089.3+y[d] 5	≥21/2	
1459.8+y[d] 6	≥23/2	
1851.0+y[d] 7	≥25/2	
2281.8+y[d] 7	≥27/2	
2748.1+y[d] 9	≥29/2	
3194.2+y[d] 9	≥31/2	
3284.9+y 11	≥31/2	
3668.9+y[d] 10	≥33/2	

† Levels already given by 1994Se01.
‡ From least-squares fit to Eγ′s.
# Band(A): γ sequence based on 5/2+.
@ Band(B): γ sequence based on 7/2+.
& Band(C): γ sequence based on 9/2+.
[a] Band(D): γ sequence based on 25/2−.
[b] Band(E): γ sequence based on 11/2−.
[c] Band(F): ΔJ=2, Decoupled band. Configuration=$\pi[h_{11/2}(g_{9/2}^{-2})(g_{7/2}d_{5/2}^{2})]\ \nu[(g_{7/2}d_{5/2})^4(h_{11/2}^2)]$.
[d] Band(G): ΔJ=1 Band, $\pi g_{9/2}^{-1}\pi(g_{7/2}d_{5/2})^2$.

^{58}Ni(^{58}Ni,2αpγ) 2000La27 (continued)

γ(^{107}Sb)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
(47† *1*)		3779.38	21/2⁻	3732.6			
(76.6† *8*)		2239.54	15/2⁺	2163.87	13/2⁺	M1+E2	
109.9 *2*	<2.0	1900.06	13/2⁺	1790.45	11/2⁺	M1+E2	
227.1 *2*	3.0 *6*	4442.7		4215.5			
228.2 *3*	<2.0	3779.38	21/2⁻	3551.21			
257.4 *2*	1.1 *1*	2878.6		2621.29	15/2⁻		
289.8 *2*	5.0 *3*	1058.28	9/2⁺	768.62	7/2⁺	M1+E2	
291.4 *2*	7.5 *5*	2163.87	13/2⁺	1872.42			
292.1 *2*	4.9 *4*	3779.38	21/2⁻	3487.11	19/2⁻	M1+E2	
293.3 *2*	2.6 *2*	5967.6	31/2⁻	5674.4	29/2⁻		
294.6 *2*	<2.0	1900.06	13/2⁺	1605.37	11/2⁻	E1	
295.9 *2*	34 *2*	2535.40	17/2⁺	2239.54	15/2⁺	M1+E2	
297.1 *2*	<2.0	3779.38	21/2⁻	3482.4			
320.9 *2*	30 *2*	4100.3	23/2⁻	3779.38	21/2⁻	M1+E2	DCO=0.64 *3*.
330.9 *2*	5.8 *5*	1388.97	9/2⁺	1058.28	9/2⁺	M1+E2	
339.6 *2*	54 *3*	2239.54	15/2⁺	1900.06	13/2⁺	M1+E2	
368.5 *4*	6.0	1089.3+y	≥21/2	720.8+y	≥19/2	M1+E2	
370.5 *3*	6.0 *5*	1459.8+y	≥23/2	1089.3+y	≥21/2	M1+E2	
373.2 *2*	<2.0	2163.87	13/2⁺	1790.45	11/2⁺	M1+E2	
384.4 *5*	1.8 *4*	3668.9+y	≥33/2	3284.9+y	≥31/2	M1+E2	
391.2 *2*	8.0 *7*	1851.0+y	≥25/2	1459.8+y	≥23/2	M1+E2	
392.3 *3*	8.0 *7*	720.8+y	≥19/2	328.5+y	≥17/2	M1+E2	
401.4 *2*	<2.0	1790.45	11/2⁺	1388.97	9/2⁺	M1+E2	
401.9 *2*	15 *1*	3779.38	21/2⁻	3377.68	19/2⁺	E1	DCO=0.60 *4*.
430.8 *3*	4.5 *3*	2281.8+y	≥27/2	1851.0+y	≥25/2	M1+E2	
438.8 *2*	10.1 *6*	4100.3	23/2⁻	3661.5	21/2⁺	E1	DCO=0.66 *5*.
446.0 *4*	2.2 *4*	3194.2+y	≥31/2	2748.1+y	≥29/2	M1+E2	
448.9 *2*	2.6 *2*	2239.54	15/2⁺	1790.45	11/2⁺	E2	
466.4 *5*	3.3 *4*	2748.1+y	≥29/2	2281.8+y	≥27/2	M1+E2	
472.8 *2*	13 *2*	3779.38	21/2⁻	3306.73			
474.7 *4*	2.0 *5*	3668.9+y	≥33/2	3194.2+y	≥31/2	M1+E2	
483.4 *2*	10 *1*	1872.42		1388.97	9/2⁺		
506.0 *2*	18 *1*	2745.65	17/2⁺	2239.54	15/2⁺	M1+E2	
506.0 *2*	2.7 *3*	4442.7		3936.6			
507.5 *2*	27 *2*	4607.7	25/2⁻	4100.3	23/2⁻	M1+E2	DCO=0.59 *3*.
516.2 *4*	<1.0	1089.3+y	≥21/2	573.1+y			
523.3 *2*	5.0 *5*	5131.1		4607.7	25/2⁻		
537.1 *5*	1.8 *5*	3284.9+y	≥31/2	2748.1+y	≥29/2		
547.0 *2*	11 *1*	1605.37	11/2⁻	1058.28	9/2⁺	E1	
560.9 *2*	5.3 *4*	3306.73		2745.65	17/2⁺		
572.0 *5*	<1.0	572.0+x		0.0+x			
573.1 *3*	<1.0	573.1+y		0.0+y			
573.2 *2*	3.0 *3*	4234.7		3661.5	21/2⁺		
620.2 *2*	<2.0	1388.97	9/2⁺	768.62	7/2⁺	M1+E2	
629.8 *3*	2.9 *2*	3936.6		3306.73			
631.5 *2*	2.8 *2*	7900.6		7269.1	35/2⁻		
637.8 *2*	8.2 *6*	5768.9		5131.1			
646.9 *2*	9.6 *9*	5089.8		4442.7			
654.7 *2*	3.0 *3*	4889.4		4234.7			
664.5 *4*	<2.0	4215.5		3551.21			
669.0 *2*	2.4 *2*	6437.9		5768.9			
688.4 *2*	5.4 *4*	5131.1		4442.7			
705.2 *2*	11.3 *8*	6379.6	33/2⁻	5674.4	29/2⁻	E2	DCO=1.09 *12*.
721.1 *2*	6.5 *5*	2621.29	15/2⁻	1900.06	13/2⁺	E1	
741.4 *2*	6.5 *5*	3487.11	19/2⁻	2745.65	17/2⁺	E1	

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^{58}Ni(^{58}Ni,2αpγ) 2000La27 (continued)

γ(^{107}Sb) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
755.6 *2*	3.9 *4*	4306.6		3551.21			
759.4 *2*	7.8 *6*	5967.6	$31/2^-$	5208.1	$27/2^-$	E2	
768.5 *3*	11.3 *5*	768.62	$7/2^+$	0.0	$5/2^+$	M1+E2	
771.5 *2*	7.0 *5*	3306.73		2535.40	$17/2^+$		
775.2 *2*	5.5 *5*	2163.87	$13/2^+$	1388.97	$9/2^+$	E2	
781.1 *3*	3.6 *8*	4442.7		3661.5	$21/2^+$		
783.8 *3*	<2.0	5089.8		4306.6			
805.8 *2*	15 *1*	3551.21		2745.65	$17/2^+$		
822‡	<1.0	2281.8+y	≥27/2	1459.8+y	≥23/2	E2	
837.7 *2*	4.3 *5*	4215.5		3377.68	$19/2^+$		
841.7 *2*	82 *5*	1900.06	$13/2^+$	1058.28	$9/2^+$	E2	
842.4 *2*	4.2 *6*	3377.68	$19/2^+$	2535.40	$17/2^+$	M1+E2	
845.7 *2*	16 *1*	2745.65	$17/2^+$	1900.06	$13/2^+$	E2	
854.2 *3*	0.9 *1*	3732.6		2878.6			
865.7 *2*	4.2 *4*	3487.11	$19/2^-$	2621.29	$15/2^-$	E2	DCO=1.06 *14* for 865.7+866.6.
866.6 *2*	4.4 *5*	8407.4	$41/2^-$	7540.8	$37/2^-$	E2	DCO=1.06 *14* for 866.6+865.7.
891.4 *2*	6.3 *6*	4442.7		3551.21			
912‡	<1.0	3194.2+y	≥31/2	2281.8+y	≥27/2	E2	
921		3668.9+y	≥33/2	2748.1+y	≥29/2		E_γ: From Figure 1 of 2000La27.
947.4 *5*	<2.0	3482.4		2535.40	$17/2^+$		
1007.9 *2*	4.1 *4*	6097.7		5089.8			
1016.0 *4*	4.3 *4*	2621.29	$15/2^-$	1605.37	$11/2^-$	E2	
1021.8 *2*	4.7 *5*	1790.45	$11/2^+$	768.62	$7/2^+$	E2	
1058.2 *2*	100	1058.28	$9/2^+$	0.0	$5/2^+$	E2	
1066.7 *2*	16 *1*	5674.4	$29/2^-$	4607.7	$25/2^-$	E2	
1067.4 *3*	4.8 *5*	3306.73		2239.54	$15/2^+$		DCO=1.04 *11*.
1107.7 *2*	12.4 *8*	5208.1	$27/2^-$	4100.3	$23/2^-$	E2	
1111.0 *4*	3.4 *3*	3732.6		2621.29	$15/2^-$		
1126.0 *2*	18 *1*	3661.5	$21/2^+$	2535.40	$17/2^+$	E2	DCO=0.97 *12*.
1126.3 *3*	2.3 *5*	3167.7+x	≥41/2	2041.4+x	≥37/2	E2	
1138.1 *2*	15 *1*	3377.68	$19/2^+$	2239.54	$15/2^+$	E2	DCO=1.08 *10*.
1161.2 *2*	7.3 *5*	7540.8	$37/2^-$	6379.6	$33/2^-$	E2	DCO=0.99 *9*.
1225.8 *4*	1.9 *2*	2041.4+x	≥37/2	815.6+x			
1243.7 *2*	3.4 *3*	3779.38	$21/2^-$	2535.40	$17/2^+$	M2	
1278.4 *3*	3.0 *4*	4446.1+x	≥45/2	3167.7+x	≥41/2	E2	
1301.5 *4*	4.3 *3*	7269.1	$35/2^-$	5967.6	$31/2^-$	E2	
1389.1 *2*	12.6 *9*	1388.97	$9/2^+$	0.0	$5/2^+$	E2	
1436.5 *4*	3.5 *4*	5882.6+x	≥49/2	4446.1+x	≥45/2	E2	
1456.1 *4*	<2.0	9863.5		8407.4	$41/2^-$		
1469.4 *4*	<1.0	2041.4+x	≥37/2	572.0+x			
1552.1 *4*	2.9 *4*	7434.8+x	≥53/2	5882.6+x	≥49/2	E2	
1793.4 *8*	1.0 *3*	9228.2+x	≥57/2	7434.8+x	≥53/2	E2	
2263 *1*	<1.0	11491.2+x	≥61/2	9228.2+x	≥57/2	E2	
2726‡	<1.0	14217.2+x	≥65/2	11491.2+x	≥61/2	E2	

† Transition not observed directly; its existence is inferred from γγ coin data.
‡ Placement of transition in the level scheme is uncertain.

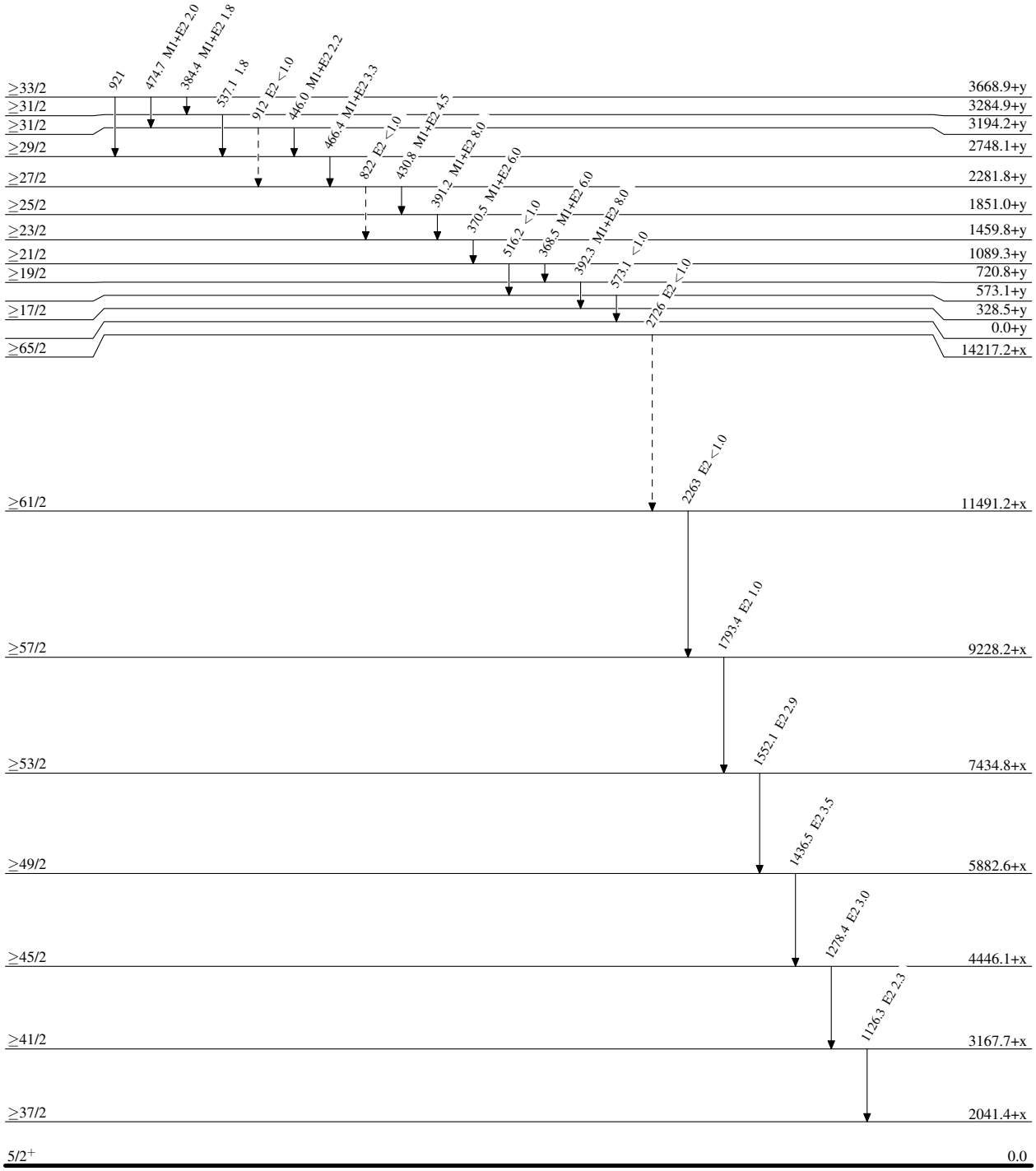
^{58}Ni(^{58}Ni,2αpγ) 2000La27

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)

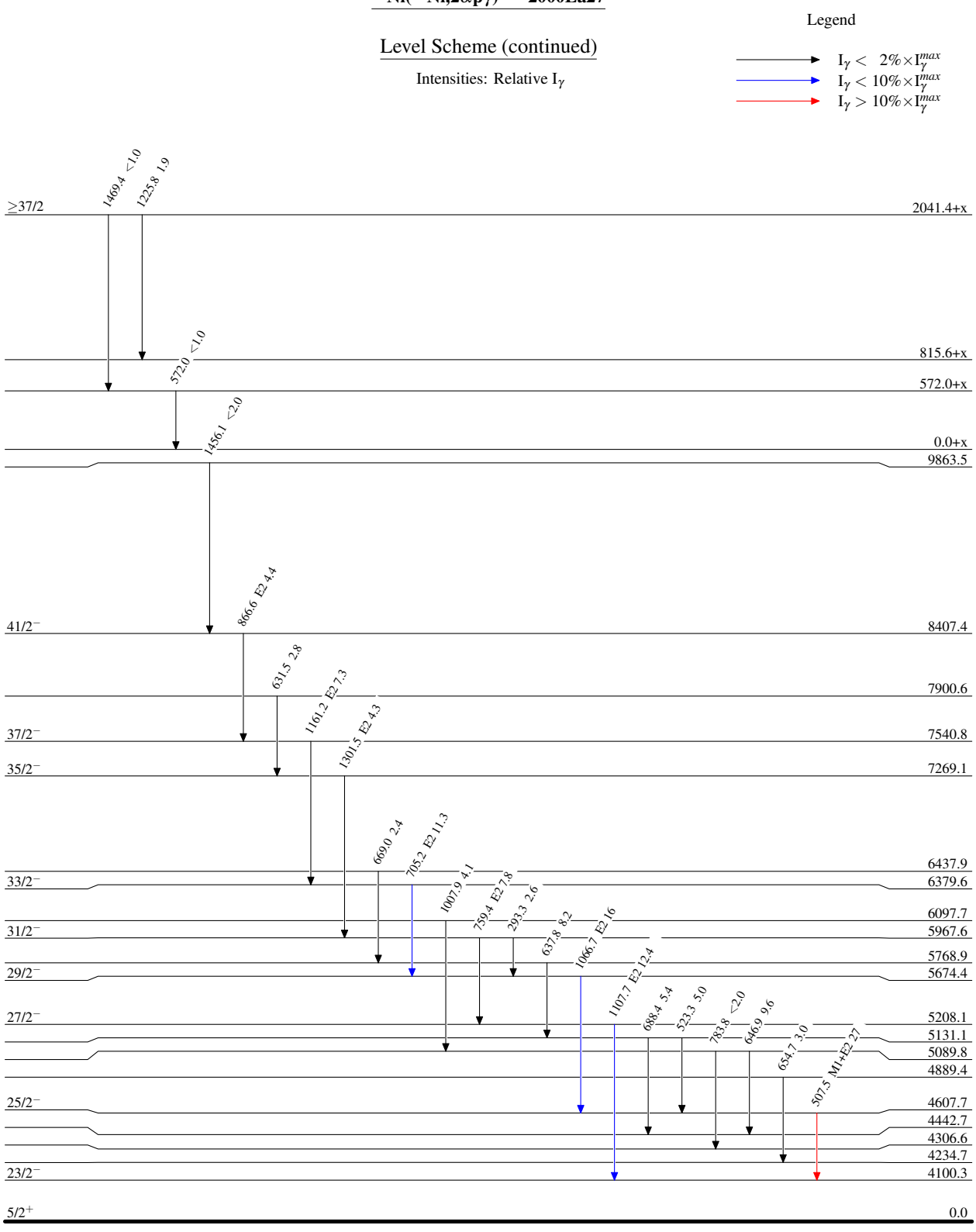


$^{107}_{51}Sb_{56}$

^{58}Ni(^{58}Ni,2αpγ) 2000La27

Level Scheme (continued)

Intensities: Relative I_γ



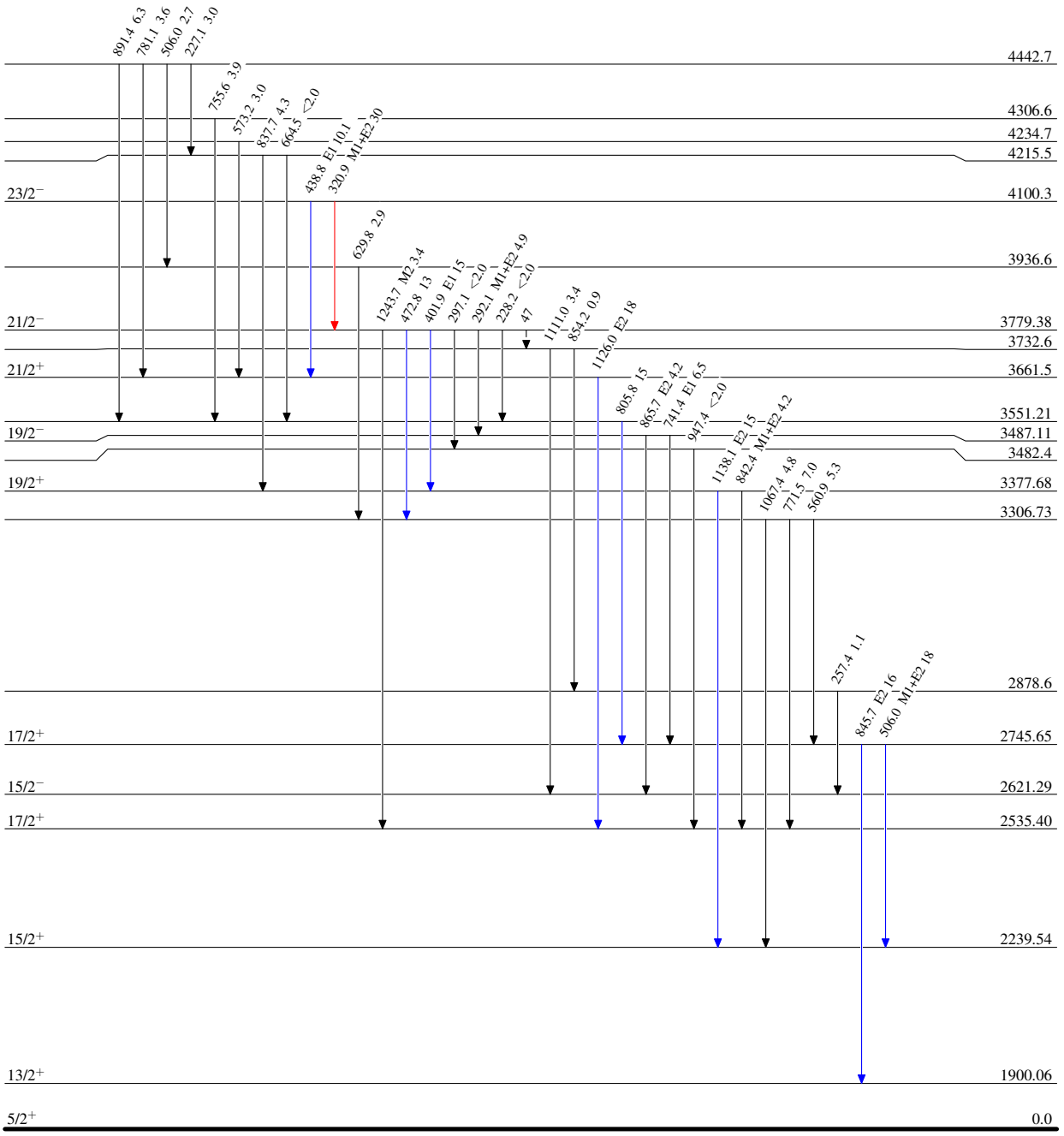
$^{107}_{51}Sb_{56}$

^{58}Ni(^{58}Ni,2αpγ) 2000La27

Level Scheme (continued)

Intensities: Relative I_γ

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)

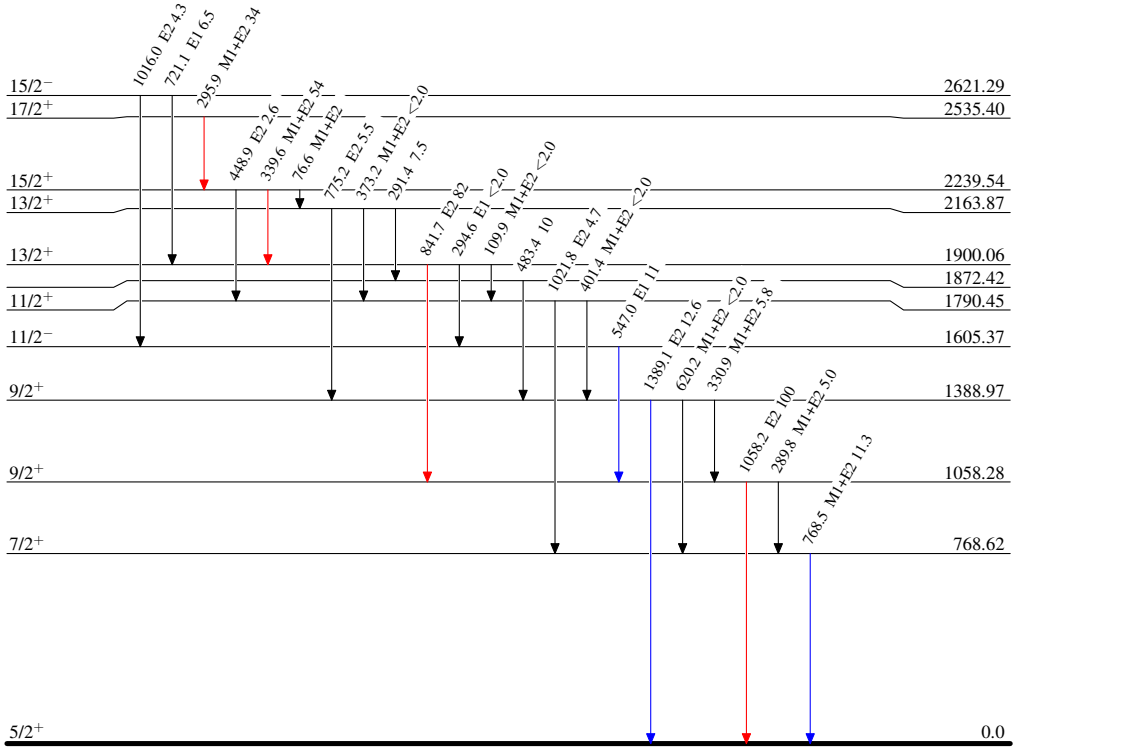


$^{107}_{51}Sb_{56}$

^{58}Ni(^{58}Ni,2αpγ) 2000La27

Level Scheme (continued)

Intensities: Relative I_γ



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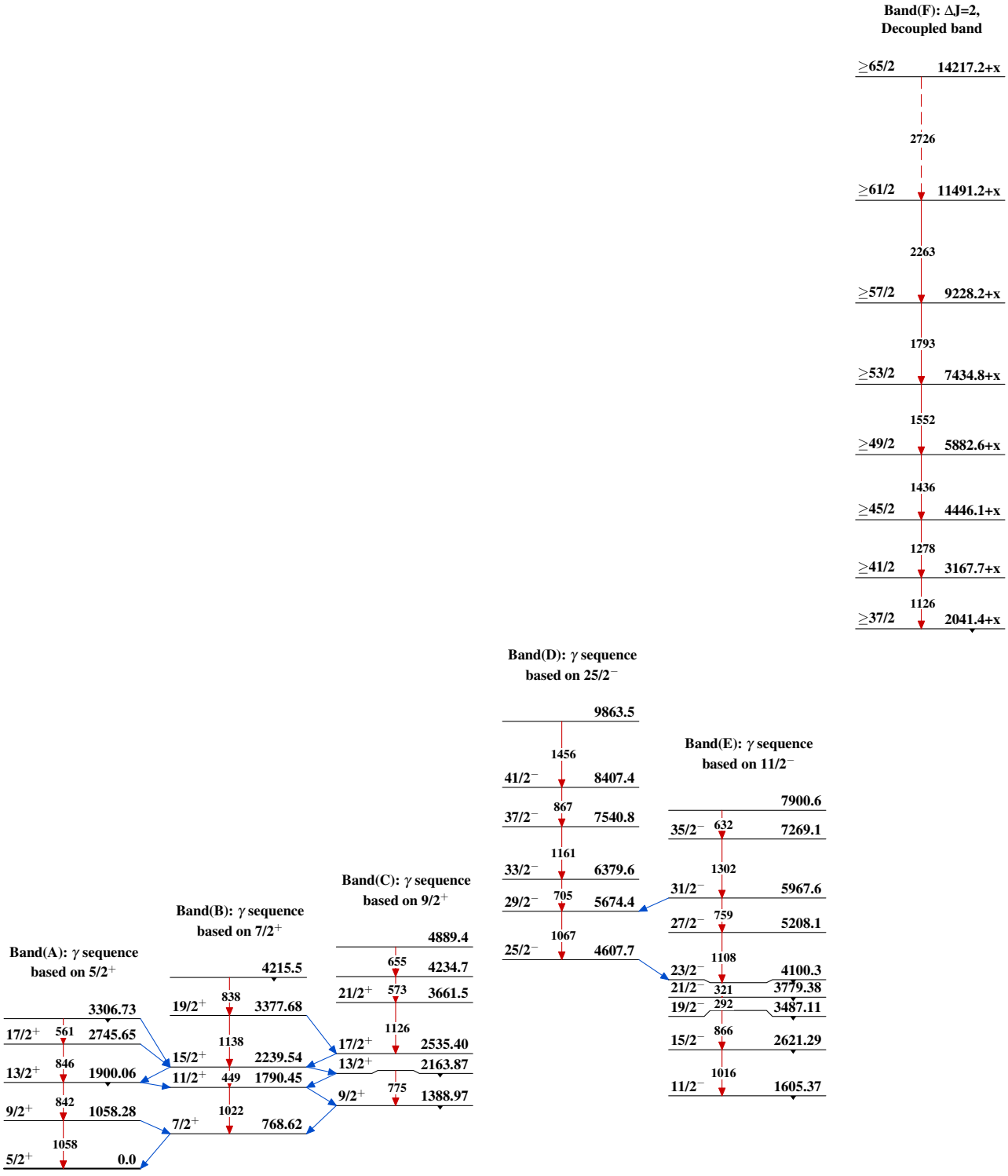
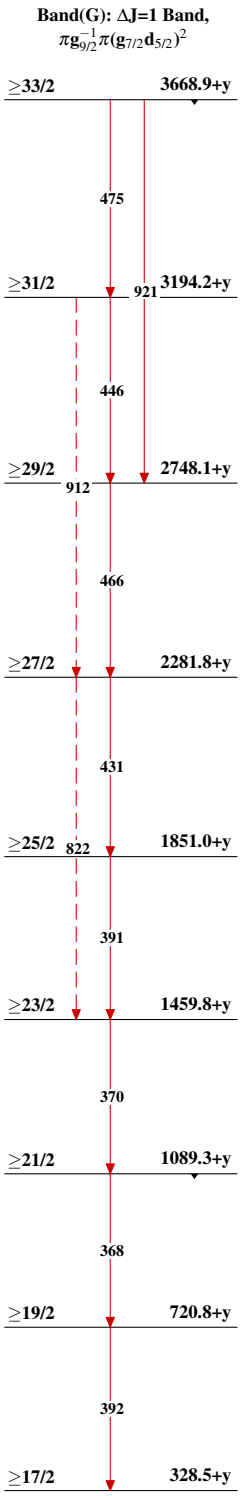
^{58}Ni(^{58}Ni,2αpγ) 2000La27



$^{107}_{51}Sb_{56}$

^{58}Ni(^{58}Ni,2αpγ) 2000La27 (continued)



$^{107}_{51}Sb_{56}$