^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	P. K. Joshi, B. Singh, S. Singh, A. K. Jain	NDS 138, 1 (2016)	15-Oct-2016

2011Zh47 (also 2010Zh12): E=120 MeV; Measured Eγ, Iγ, DCO, $\gamma\gamma$-coin using 12 Compton suppressed Ge detectors at the HI-13 accelerator of CIAE-Beijing. Deduced levels, J, π, possible magnetic dipole rotational band.
2011ZhZU: priv. comm. from N.T. Zhang, first author of 2011Zh47 in response to query by B. Singh.

^{139}Pm Levels

E(level)[†]	J$^{\pi}$[#]	$T_{1/2}$	Comments
0.0[‡]	(5/2$^+$)[‡]		
188.7[‡@] *3*	11/2$^-$[‡]	180 ms *20*	%IT=100; %ε+%β^+<0.05 $T_{1/2}$ and decay mode from Adopted Levels.
654.6[@] *4*	15/2$^-$		
785.7[&] *4*	13/2$^-$		
1284.5[a] *5*	15/2$^-$		
1376.1[&] *4*	17/2$^-$		
1406.1[@] *4*	19/2$^-$		
1714.0[f] *4*	15/2$^{(+)}$		
1902.9[a] *4*	19/2$^-$		
1951.9[f] *4*	17/2$^{(+)}$		
2090.8[f] *4*	19/2$^{(+)}$		
2107.6[d] *4*	19/2$^+$		
2190.8[&] *4*	21/2$^-$		
2302.8[f] *4*	21/2$^{(+)}$		
2352.5[@] *4*	23/2$^-$		
2518.3[e] *5*	21/2$^+$		
2571.4[f] *4*	23/2$^{(+)}$		
2614.7 *6*			
2691.3[d] *4*	23/2$^+$		
2768.4[a] *5*	23/2$^-$		
2799.4[f] *5*	25/2$^{(+)}$		
2964.8[e] *4*	25/2$^+$		
3024.6 *5*			
3157.9[b] *4*	25/2$^-$		
3200.2[&] *4*	25/2$^-$		
3262.4[b] *4*	27/2$^-$		
3281.4[d] *4*	27/2$^+$		
3390.7 *6*			
3417.0[@] *4*	27/2$^-$		
3459.9 *6*			
3488.4 *5*			
3531.9 *6*			
3559.1[e] *4*	29/2$^+$		
3592.0[b] *4*	29/2$^-$		
3611.4 *7*			
3749.5[a] *5*	27/2$^-$		
3908.7[b] *4*	31/2$^-$		
4056.4[d] *5*	31/2$^+$		
4083.4 *6*			

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^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU (continued)

^{139}Pm Levels (continued)

E(level)[†]	Jπ[#]	Comments
4224.4 *7*		
4279.6 *6*		
4381.7[b] *4*	33/2⁻	
4383.3[@] *4*	31/2⁻	
4418.4[e] *5*	33/2⁺	
4503.6 *5*		
4542.3 *6*		
4914.6[b] *5*	35/2⁻	
4923.2 *5*		
4932.2[d] *6*	35/2⁺	
5092.4 *8*		
5183.2[c] *5*	35/2⁻	
5184.0[@] *4*	35/2⁻	
5236.1 *6*		
5248.8 *7*		
5249.1 *7*		
5336.9 *7*		
5407.5[c] *5*	37/2⁻	
5505.5[e] *6*	37/2⁺	
5572.3[b] *7*	(37/2⁻)	
5635.8 *7*		
5669.6[c] *6*	39/2⁻	
5992.8 *13*		
5996.8[d] *8*	(39/2⁺)	
6058.8[@] *4*	39/2⁻	
6123.9[c] *7*	41/2⁻	
6220.2 *8*		
6518.4[c] *8*	43/2⁻	
6704.9 *8*		
6719.3 *8*		
7001.4[@] *4*	43/2⁻	
7094.4 *6*		
7120.5[c] *9*	(45/2⁻)	
7433.8[c] *10*	(47/2⁻)	
7664.4[@] *5*	47/2⁻	
8445.7[@] *5*	51/2⁻	
9177.5 *6*		
9362.5[@] *8*	(55/2⁻)	
9901.0 *8*		
0+x[g]		Additional information 1.
244.3+x[g] *5*		
518.7+x[g] *6*		
838.9+x[g] *7*		
1208.4+x[g] *8*		
1640.8+x[g] *8*		
2137.8+x[g] *9*		

[†] From least-squares fit to Eγ data.
[‡] From Adopted Levels.

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^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU (continued)

^{139}Pm Levels (continued)

As proposed in 2011Zh47 from yrast population, $\gamma\gamma(\theta)$(DCO) measurements, and band structures.
@ Band(A): Yrast, ΔJ=2 band based on 11/2$^-$. Two sharp band crossings are observed at $\hbar\omega$=0.39 and 0.45 MeV, first corresponding to alignment of $h_{11/2}$ neutron pair and the second due to alignment of $h_{11/2}$ proton pair.
& Band(B): ΔJ=2 band based on 13/2$^-$.
a Band(C): ΔJ=2 band based on 15/2$^-$.
b Band(D): ΔJ=1 band based on 25/2$^-$. Possible magnetic-dipole rotational band with tentative configuration $(\pi h_{11/2})\otimes(\nu h_{11/2})^{-2}$ (2011Zh47).
c Band(E): ΔJ=1 band based on 35/2$^-$. Possible magnetic-dipole rotational band with tentative configuration $(\pi h_{11/2})\otimes(\nu h_{11/2})^{-4}$ (2011Zh47).
d Band(F): ΔJ=2 band based on 19/2$^+$.
e Band(G): ΔJ=2 band based on 21/2$^+$.
f Band(H): ΔJ=1 band based on 15/2$^{(+)}$.
g Band(I): γ sequence.

γ(^{139}Pm)

DCO(Q) and DCO(D) indicate gate on ΔJ=2, quadrupole and ΔJ=1, dipole, respectively. All DCO and R(ADO) values are from 2011ZhZU Expected DCO values are 1.0 for ΔJ=2, quadrupole and 0.6 for ΔJ=1, dipole, respectively, for gate on ΔJ=2, quadrupole. If the gate is on ΔJ=1, dipole, then expected DCO is 1.5 for ΔJ=2, quadrupole and 0.9 for ΔJ=1, dipole.

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	Comments
62.1 *5*		3262.4	27/2$^-$	3200.2	25/2$^-$		
104.2 *3*	5.2 *8*	3262.4	27/2$^-$	3157.9	25/2$^-$		
139.0 *3*	8.2 *10*	2090.8	19/2$^{(+)}$	1951.9	17/2$^{(+)}$		
188.7 *3*		188.7	11/2$^-$	0.0	(5/2$^+$)	E3	E_γ,Mult.: from Adopted Gammas.
212.0 *1*	19.0 *14*	2302.8	21/2$^{(+)}$	2090.8	19/2$^{(+)}$	(D)	DCO(Q)=0.77 *5* R(ADO)=1.04 *9*.
224.4 *3*	6.9 *8*	5407.5	37/2$^-$	5183.2	35/2$^-$	D	DCO(D)=1.12 *16* R(ADO)=0.98 *10*.
228.0 *3*	8.5 *10*	2799.4	25/2$^{(+)}$	2571.4	23/2$^{(+)}$	D	DCO(Q)=0.72 *3* R(ADO)=0.98 *6*.
237.8 *5*	2.4 *6*	1951.9	17/2$^{(+)}$	1714.0	15/2$^{(+)}$		R(ADO)=1.14 *19*.
244.3 *5*	<2.2	244.3+x		0+x			
262.1 *3*	8.2 *9*	5669.6	39/2$^-$	5407.5	37/2$^-$	D	DCO(D)=1.08 *18* R(ADO)=0.85 *4*.
268.6 *1*	22.0 *24*	2571.4	23/2$^{(+)}$	2302.8	21/2$^{(+)}$	D	DCO(Q)=0.67 *8* R(ADO)=0.84 *7*.
274.4 *3*	4.4 *10*	518.7+x		244.3+x		D	DCO(Q)=0.62 *5* R(ADO)=0.62 *10*.
277.9 *5*	<1.0	3559.1	29/2$^+$	3281.4	27/2$^+$		
x288.0 *5*	2.4 *3*						
313.3 *5*	2.2 *6*	7433.8	(47/2$^-$)	7120.5	(45/2$^-$)	(D)	DCO(D)=0.81 *10* R(ADO)=0.82 *8*.
316.7 *1*	20.6 *21*	3908.7	31/2$^-$	3592.0	29/2$^-$	D	DCO(Q)=0.61 *5* R(ADO)=0.85 *10*.
320.2 *3*	5.4 *10*	838.9+x		518.7+x		D	DCO(Q)=0.61 *12* R(ADO)=0.61 *13*.
329.6 *1*	36.4 *32*	3592.0	29/2$^-$	3262.4	27/2$^-$	D	DCO(Q)=0.61 *3* R(ADO)=0.82 *4*.
x333.1 *5*	0.6 *1*						
338.5 *5*	2.9 *2*	2691.3	23/2$^+$	2352.5	23/2$^-$	D	DCO(Q)=0.86 *13*

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^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU (continued)

γ(^{139}Pm) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	Comments
							Mult.: ΔJ=0 transition. R(ADO)=1.90 *34*.
x360.4 *3*	3.5 *6*					D	DCO(Q)=0.45 *6* R(ADO)=0.87 *12*.
369.5 *3*	5.0 *8*	1208.4+x		838.9+x		D	DCO(Q)=0.51 *11* R(ADO)=0.98 *8*.
393.3 *3*	6.0 *6*	2964.8	25/2$^+$	2571.4	23/2$^{(+)}$	D	DCO(D)=0.77 *8* R(ADO)=0.96 *9*.
394.5 *3*	3.7 *4*	6518.4	43/2$^-$	6123.9	41/2$^-$	D	DCO(D)=0.80 *18* R(ADO)=0.79 *14*.
x401.2 *5*	1.2 *1*						R(ADO)=0.91 *16*.
432.4 *3*	5.2 *5*	1640.8+x		1208.4+x		D	DCO(Q)=0.50 *7* R(ADO)=0.78 *10*.
446.4 *5*	2.9 *4*	2964.8	25/2$^+$	2518.3	21/2$^+$	(Q)	DCO(Q)=0.85 *28* R(ADO)=1.8 *6*.
453.2 *3*	5.0 *9*	3024.6		2571.4	23/2$^{(+)}$		DCO(D)=0.68 *10* R(ADO)=0.67 *9*.
454.3 *3*	4.8 *8*	6123.9	41/2$^-$	5669.6	39/2$^-$	D	DCO(D)=0.98 *14* R(ADO)=0.61 *11*.
465.9 *1*	157 *9*	654.6	15/2$^-$	188.7	11/2$^-$	Q	DCO(Q)=1.05 *17* R(ADO)=1.81 *9*.
473.0 *1*	14.3 *10*	4381.7	33/2$^-$	3908.7	31/2$^-$	D	DCO(Q)=0.47 *4* R(ADO)=0.62 *5*.
492.9 *5*	0.8 *5*	5407.5	37/2$^-$	4914.6	35/2$^-$		
497.0 *3*	3.6 *2*	2137.8+x		1640.8+x		(D)	R(ADO)=0.67 *26*.
497.4 *5*	2.8 *3*	4056.4	31/2$^+$	3559.1	29/2$^+$	D	DCO(Q)=0.56 *11* R(ADO)=0.45 *12*.
498.9 *5*	1.5 *2*	1284.5	15/2$^-$	785.7	13/2$^-$		
523.5 *5*	2.2 *2*	3488.4		2964.8	25/2$^+$		
526.8 *3*	4.2 *3*	1902.9	19/2$^-$	1376.1	17/2$^-$	D	R(ADO)=0.52 *9*.
533.0 *3*	4.8 *5*	4914.6	35/2$^-$	4381.7	33/2$^-$	D	DCO(Q)=0.62 *14* R(ADO)=0.69 *10*.
551.4 *5*	1.1 *1*	4083.4		3531.9			
x563.8 *5*	2.4 *2*						
567.9 *5*	1.1 *2*	4056.4	31/2$^+$	3488.4			
569.8 *5*	<1.4	7664.4	47/2$^-$	7094.4			
583.7 *1*	13.1 *12*	2691.3	23/2$^+$	2107.6	19/2$^+$	Q	DCO(Q)=1.06 *17* R(ADO)=1.58 *13*.
586.8 *5*	1.0 *2*	3611.4		3024.6			
590.1 *1*	12.0 *6*	3281.4	27/2$^+$	2691.3	23/2$^+$	Q	DCO(Q)=1.07 *7* R(ADO)=1.66 *10*.
590.4 *3*	4.6 *4*	1376.1	17/2$^-$	785.7	13/2$^-$	Q	DCO(Q)=1.04 *15* R(ADO)=1.34 *27*.
591.3 *3*	3.9 *3*	3390.7		2799.4	25/2$^{(+)}$		R(ADO)=1.16 *14*.
594.3 *1*	16.2 *12*	3559.1	29/2$^+$	2964.8	25/2$^+$	Q	DCO(Q)=0.97 *6* R(ADO)=1.58 *7*.
597.0 *3*	5.2 *4*	785.7	13/2$^-$	188.7	11/2$^-$	D	DCO(Q)=0.54 *8* R(ADO)=0.73 *14*.
602.1 *5*	<2.6	7120.5	(45/2$^-$)	6518.4	43/2$^-$	(D)	DCO(D)=0.93 *42* R(ADO)=0.83 *23*.
612.3 *1*	13.1 *8*	2964.8	25/2$^+$	2352.5	23/2$^-$	D	DCO(Q)=0.58 *4* R(ADO)=0.78 *5*.
618.4 *5*	1.8 *3*	1902.9	19/2$^-$	1284.5	15/2$^-$	Q	R(ADO)=1.44 *43*.
x622.3 *5*	2.9 *2*						
633.7 *3*	3.8 *3*	4383.3	31/2$^-$	3749.5	27/2$^-$	Q	DCO(Q)=0.87 *22* R(ADO)=1.31 *27*.

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^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU (continued)

γ(^{139}Pm) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
646.2 *5*	1.9 *4*	3908.7	$31/2^-$	3262.4	$27/2^-$	Q	R(ADO)=1.31 *30*.
657.7 *5*	1.5 *2*	5572.3	$(37/2^-)$	4914.6	$35/2^-$	(D)	R(ADO)=0.70 *21*.
661.8 *5*	<1.1	2964.8	$25/2^+$	2302.8	$21/2^{(+)}$		
663.0 *1*	12.5 *7*	7664.4	$47/2^-$	7001.4	$43/2^-$	Q	DCO(Q)=0.91 *9* R(ADO)=1.42 *23*.
[x]668.8 *3*	3.4 *3*						
687.5 *5*	<3.0	4279.6		3592.0	$29/2^-$		DCO(D)=0.97 *20* R(ADO)=0.62 *10*.
692.7 *3*	3.6 *4*	4083.4		3390.7			R(ADO)=1.62 *29*.
[x]695.8 *3*	3.3 *2*						
701.6 *1*	13.0 *7*	2107.6	$19/2^+$	1406.1	$19/2^-$	D	DCO(Q)=1.07 *6* Mult.: ΔJ=0 transition. R(ADO)=1.67 *23*.
[x]705.8 *5*	<3.0						
714.6 *5*	1.7 *2*	2090.8	$19/2^{(+)}$	1376.1	$17/2^-$		
721.5 *1*	19.4 *10*	1376.1	$17/2^-$	654.6	$15/2^-$	D	DCO(Q)=0.42 *6* R(ADO)=0.41 *4*.
[x]723.5 *5*	<1.9						
723.5 *5*	<1.9	9901.0		9177.5			
731.5 *5*	1.4 *2*	2107.6	$19/2^+$	1376.1	$17/2^-$		
731.8 *3*	3.1 *4*	9177.5		8445.7	$51/2^-$		R(ADO)=0.61 *2*.
732.5 *3*	4.7 *4*	3531.9		2799.4	$25/2^{(+)}$		R(ADO)=1.13 *17*.
744 *1*	<2.1	5992.8		5248.8			
745.2 *5*	<2.1	5248.8		4503.6			
751.4 *1*	100.0	1406.1	$19/2^-$	654.6	$15/2^-$	Q	DCO(Q)=0.93 *3* R(ADO)=1.50 *5*.
775.0 *3*	5.6 *4*	4056.4	$31/2^+$	3281.4	$27/2^+$	Q	DCO(Q)=0.94 *11* R(ADO)=1.25 *20*.
781 *1*	4.3 *4*	7001.4	$43/2^-$	6220.2			
781.3 *3*	7.6 *4*	8445.7	$51/2^-$	7664.4	$47/2^-$	Q	DCO(Q)=1.03 *9* R(ADO)=1.54 *14*.
784.6 *1*	11.4 *7*	2190.8	$21/2^-$	1406.1	$19/2^-$	D	DCO(Q)=0.44 *6* R(ADO)=0.47 *4*.
790		4381.7	$33/2^-$	3592.0	$29/2^-$		
[x]792.8 *3*	3.2 *2*						
800 *1*	>3.7	5183.2	$35/2^-$	4383.3	$31/2^-$		
800.7 *1*	<14.9	5184.0	$35/2^-$	4383.3	$31/2^-$	Q	DCO(Q)=1.03 *5* R(ADO)=1.62 *14*.
801.6 *3*	5.4 *6*	5183.2	$35/2^-$	4381.7	$33/2^-$	D	DCO(D)=0.85 *17* R(ADO)=0.78 *5*.
805.7 *3*	3.3 *5*	3157.9	$25/2^-$	2352.5	$23/2^-$	D	DCO(Q)=0.44 *14* R(ADO)=0.51 *6*.
814.8 *1*	12.1 *5*	2190.8	$21/2^-$	1376.1	$17/2^-$	Q	DCO(Q)=0.90 *15* R(ADO)=1.54 *21*.
830.7 *5*	1.5 *2*	5249.1		4418.4	$33/2^+$		
847.8 *5*	<3.7	3200.2	$25/2^-$	2352.5	$23/2^-$		
[x]850.3 *5*	2.0 *1*						
854.5 *5*	1.5 *1*	5236.1		4381.7	$33/2^-$		
859.3 *3*	8.6 *6*	4418.4	$33/2^+$	3559.1	$29/2^+$	Q	DCO(Q)=1.00 *11* R(ADO)=1.48 *18*.
865.4 *3*	5.5 *5*	2768.4	$23/2^-$	1902.9	$19/2^-$	Q	DCO(Q)=1.10 *17* R(ADO)=1.48 *29*.
874.8 *1*	14.5 *8*	6058.8	$39/2^-$	5184.0	$35/2^-$	Q	DCO(Q)=1.04 *12* R(ADO)=1.43 *15*.
875.8 *3*	4.0 *3*	4932.2	$35/2^+$	4056.4	$31/2^+$	Q	DCO(Q)=1.14 *25* R(ADO)=1.37 *13*.

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^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU (continued)

γ(^{139}Pm) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
[x]881.3 *5*	2.9 *2*						
896.6 *3*	9.6 *6*	2302.8	21/2$^{(+)}$	1406.1	19/2$^-$	D	DCO(Q)=0.52 *10* R(ADO)=0.81 *14*.
[x]897.7 *5*	<1.2						
903.5 *5*	0.8 *1*	5183.2	35/2$^-$	4279.6			
909.9 *1*	23.6 *12*	3262.4	27/2$^-$	2352.5	23/2$^-$	Q	DCO(Q)=0.87 *9* R(ADO)=1.26 *14*.
911.6 *5*		4503.6		3592.0	29/2$^-$		
916.8 *5*	2.4 *3*	9362.5	(55/2$^-$)	8445.7	51/2$^-$	(Q)	R(ADO)=1.69 *31*.
942.6 *1*	11.5 *7*	7001.4	43/2$^-$	6058.8	39/2$^-$	Q	DCO(Q)=0.87 *8* R(ADO)=1.44 *17*.
943.0 *5*	1.5 *3*	4224.4		3281.4	27/2$^+$		
946.5 *1*	65.7 *23*	2352.5	23/2$^-$	1406.1	19/2$^-$	Q	DCO(Q)=0.93 *4* R(ADO)=1.40 *15*.
955.2 *5*	1.0 *1*	5336.9		4381.7	33/2$^-$		
966.3 *1*	12.6 *6*	4383.3	31/2$^-$	3417.0	27/2$^-$	Q	DCO(Q)=0.95 *8* R(ADO)=1.51 *13*.
967.1 *1*	13.9 *7*	3157.9	25/2$^-$	2190.8	21/2$^-$	Q	DCO(Q)=0.90 *9* R(ADO)=1.51 *15*.
971.5[#] *5*	1.1 *3*	6220.2		5248.8			
981.0 *3*	4.1 *3*	3749.5	27/2$^-$	2768.4	23/2$^-$	Q	R(ADO)=1.54 *23*.
1005.6 *5*	1.2 *1*	4914.6	35/2$^-$	3908.7	31/2$^-$		
1009.0 *5*	2.4 *2*	5092.4		4083.4			
1009.4 *3*	7.6 *4*	3200.2	25/2$^-$	2190.8	21/2$^-$	Q	DCO(Q)=0.92 *8* R(ADO)=1.28 *11*.
1014.5 *3*	3.1 *3*	4923.2		3908.7	31/2$^-$	D	DCO(Q)=0.56 *8* R(ADO)=0.52 *8*.
1035.5 *5*	1.4 *2*	7094.4		6058.8	39/2$^-$		
1036 *1*	1.2 *3*	6220.2		5184.0	35/2$^-$		
1059.4 *3*	3.6 *2*	1714.0	15/2$^{(+)}$	654.6	15/2$^-$	D	R(ADO)=1.58 *24*. Mult.: ΔJ=0 transition.
1064.5 *1*	18.8 *8*	3417.0	27/2$^-$	2352.5	23/2$^-$	Q	DCO(Q)=0.96 *6* R(ADO)=1.40 *12*.
1064.6 *5*	1.4 *2*	5996.8	(39/2$^+$)	4932.2	35/2$^+$	(Q)	R(ADO)=1.30 *16*.
[x]1082.8 *5*	1.0 *1*						
1086.7 *5*	0.6 *1*	4503.6		3417.0	27/2$^-$		
1087.1 *3*	3.9 *1*	5505.5	37/2$^+$	4418.4	33/2$^+$	Q	DCO(Q)=0.82 *15* R(ADO)=1.11 *15*.
1107.4 *5*	1.4 *2*	3459.9		2352.5	23/2$^-$		
1112.2 *3*	4.1 *3*	2518.3	21/2$^+$	1406.1	19/2$^-$	(D)	R(ADO)=0.81 *10*.
1125.3 *5*	0.7 *1*	4542.3		3417.0	27/2$^-$		
1199.4 *5*		6704.9		5505.5	37/2$^+$		
1208.6 *5*	1.6 *1*	2614.7		1406.1	19/2$^-$		
1213.8 *5*		6719.3		5505.5	37/2$^+$		
1248.1 *5*	1.1 *1*	1902.9	19/2$^-$	654.6	15/2$^-$		
1254.1 *5*		5635.8		4381.7	33/2$^-$		
1274.3 *5*	1.7 *1*	5183.2	35/2$^-$	3908.7	31/2$^-$	Q	R(ADO)=1.50 *10*.
1297.3 *1*	25.7 *11*	1951.9	17/2$^{(+)}$	654.6	15/2$^-$	D	DCO(Q)=0.63 *3* R(ADO)=0.72 *5*.
1327.4 *5*	0.9 *5*	5236.1		3908.7	31/2$^-$		

[†] From 2011ZhZU, where the energy uncertainty was stated to be within 0.5 keV. The evaluators assign 0.1 keV for Iγ>10, 0.3 for Iγ=3-10 and 0.5 keV for Iγ<3 as well as when Iγ not given. Uncertainty of 1 keV is assigned when Eγ is stated to the nearest

Continued on next page (footnotes at end of table)

^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU (continued)

$\gamma(^{139}Pm)$ (continued)

keV.

‡ Assigned by the evaluators based on DCO and ADO data. Mult=Q indicates ΔJ=2, quadrupole (most likely E2) and mult=D indicates ΔJ=1, dipole transition.

Placement of transition in the level scheme is uncertain.

x γ ray not placed in level scheme.

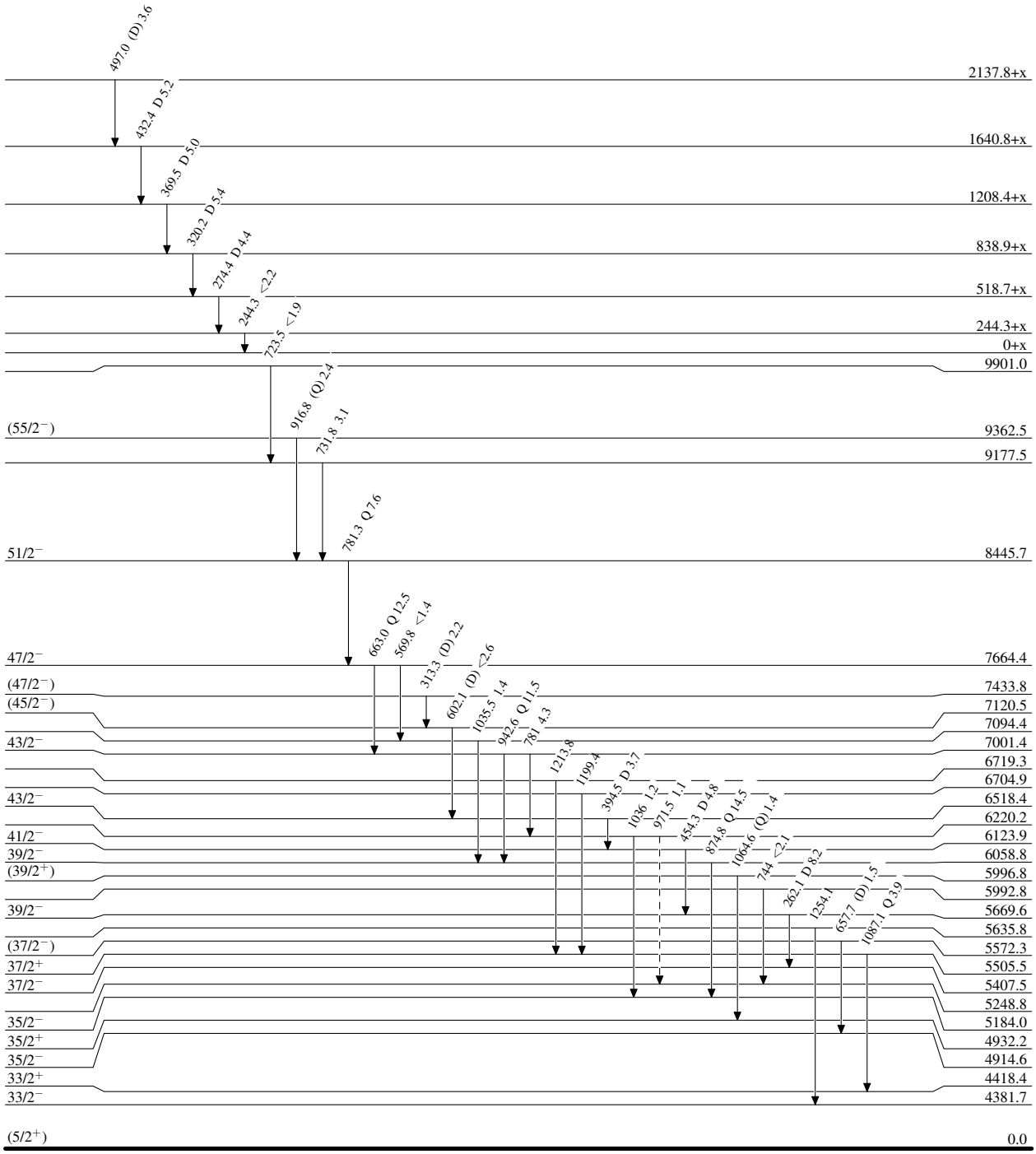
^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU

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)



$^{139}_{61}Pm_{78}$

^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU

Level Scheme (continued)

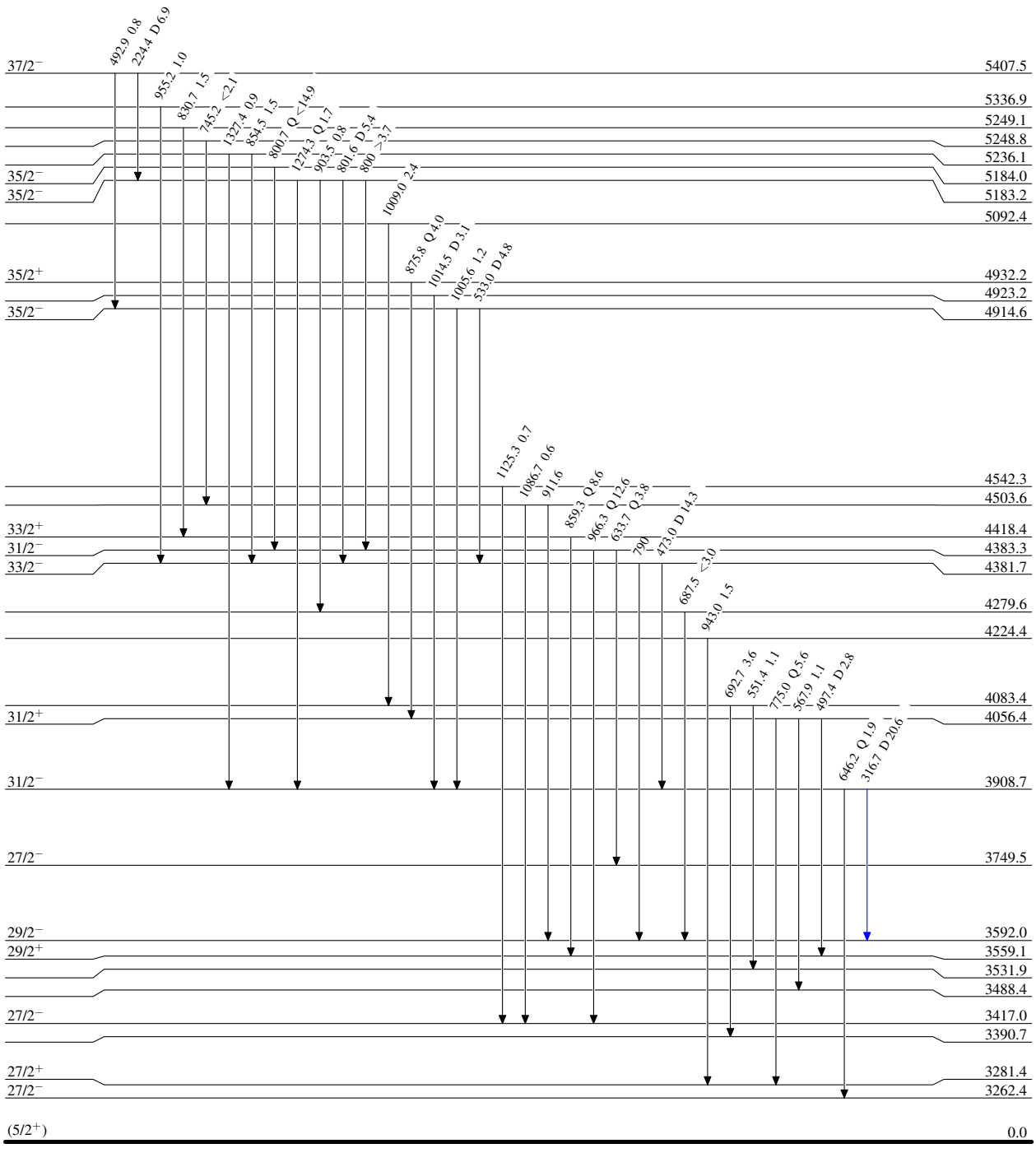
Intensities: Relative I_γ

Legend

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

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

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



$^{139}_{61}Pm_{78}$

^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU

Level Scheme (continued)

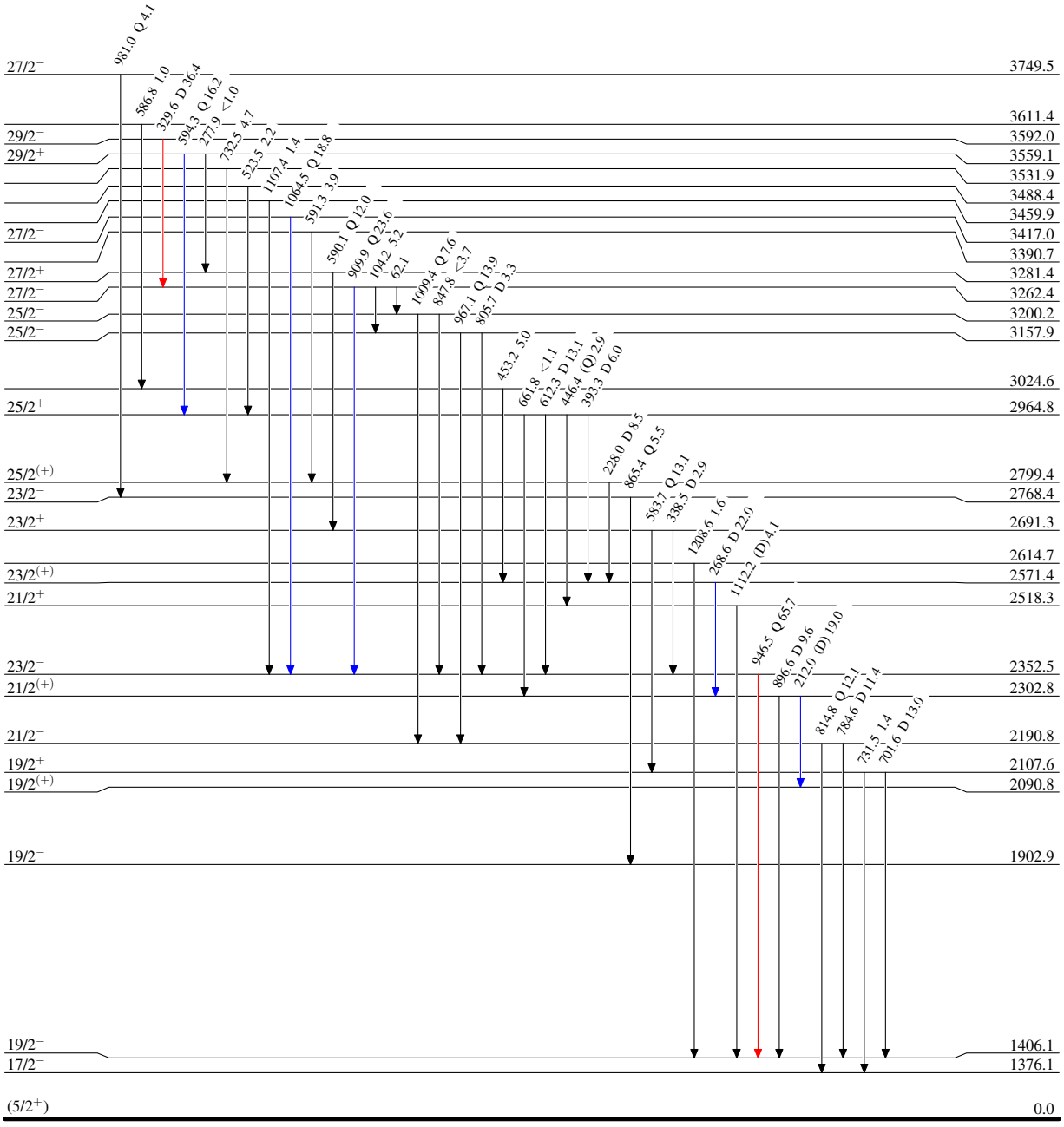
Intensities: Relative I_γ

Legend

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

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

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



$^{139}_{61}Pm_{78}$

^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU

Level Scheme (continued)

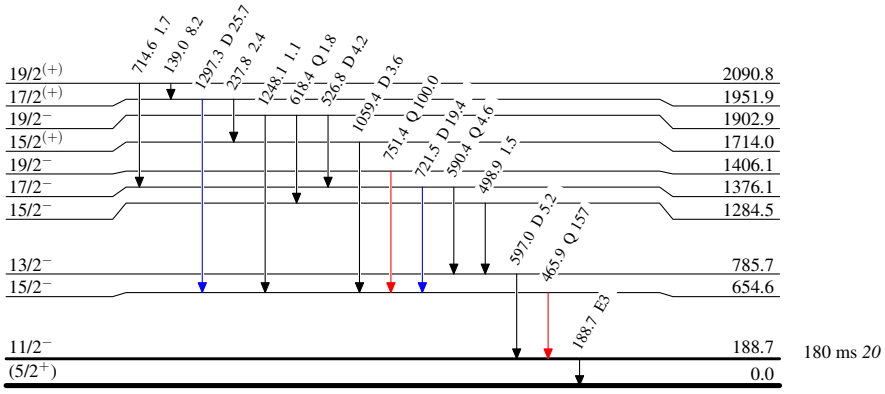
Intensities: Relative I_γ

Legend

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

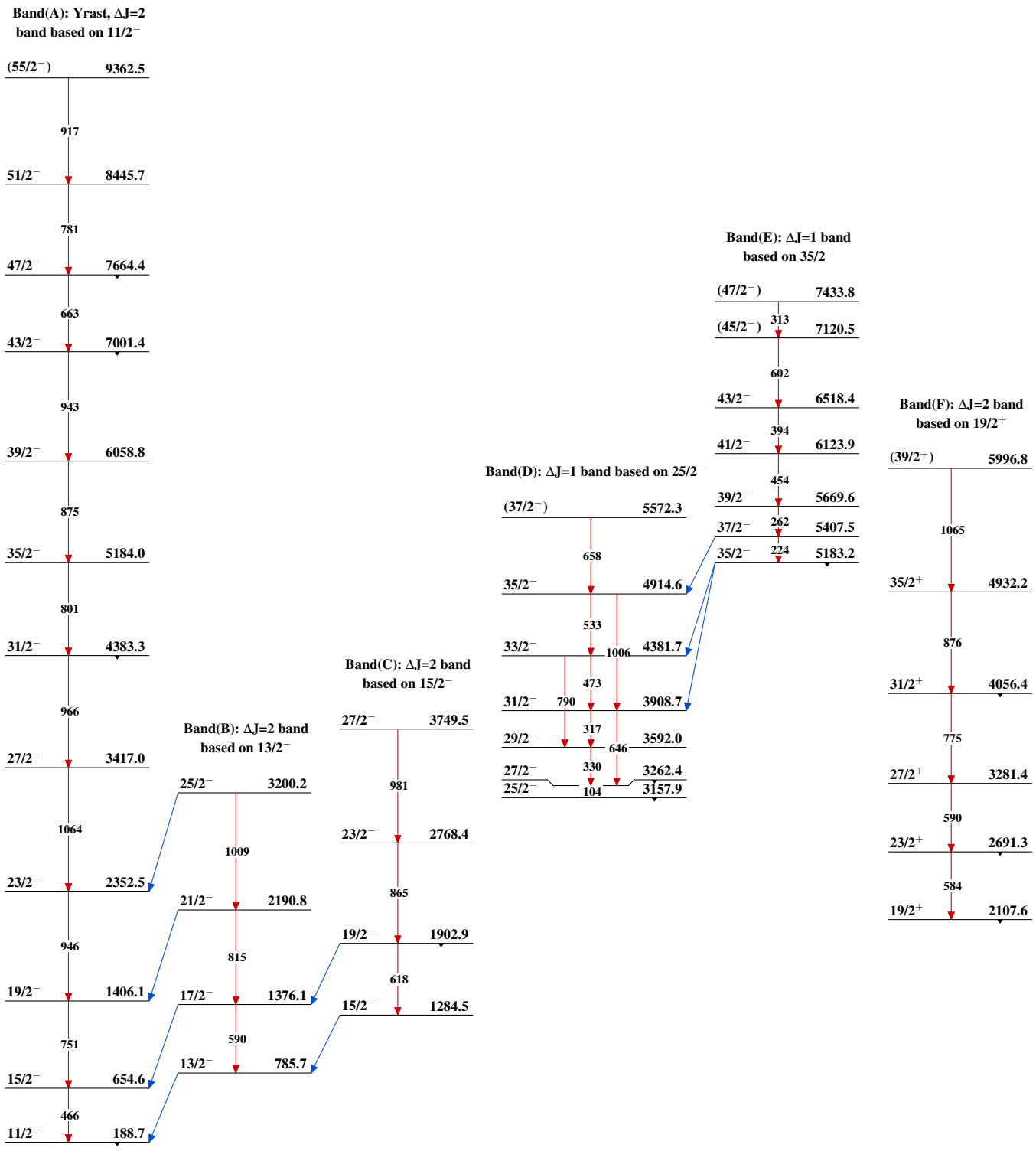
$I_\gamma < 10\% \times I_\gamma^{max}$

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



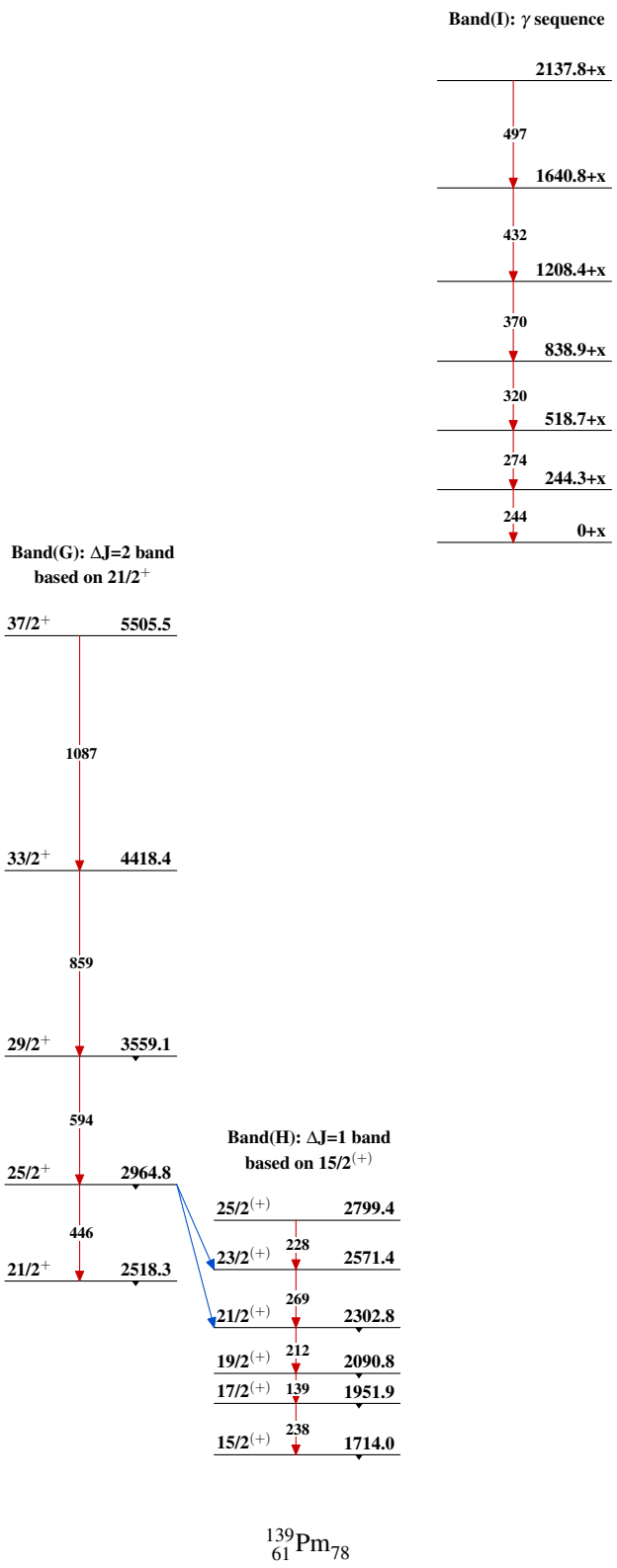
$^{139}_{61}Pm_{78}$

^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU



$^{139}_{61}Pm_{78}$

^{116}Cd(^{27}Al,4nγ):ciae 2011Zh47,2011ZhZU (continued)



$^{139}_{61}Pm_{78}$