Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 113, 157 (2012)	31-Dec-2010

Q(β^-)=−6.86×10^3 *4*; S(n)=1.057×10^4 *4*; S(p)=9.9×10^2 *4*; Q(α)=4.49×10^3 *4* 2017Wa10
Q(ε)=6.13×10^3 *4*; S(2n)=1.941×10^4 *4*; S(2p)=5.58×10^3 *4*; Q(εp)=1.71×10^3 *5* 2017Wa10
Additional information 1.
Additional information 2.
All data and assignments for the excited levels and the γ's are from the ^{144}Sm(^{19}F,4nγ) study. No level-specific J$^\pi$ arguments are given here. See the high-spin data set for comments.

^{159}Lu Levels

Cross Reference (XREF) Flags

A ^{163}Ta α decay
B ^{144}Sm(^{19}F,4nγ)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	XREF	Comments
0		12.1 s *10*	A	%ε+%β^+=100; %α=0.1 syst J$^\pi$: From systematics, 2003Au02 propose J^π=1/2$^+$. $T_{1/2}$: Weighted average of 9.2 s *35* from ^{159}Lu α decay (1992Ha10) and 12.3 s *10* [author's average of 12.5 s *10* from ^{159}Lu ε decay by γ(t) and Kα x ray(t) and 12.0 s *15* from Iα(t) in 1980Al14]. %α: From extrapolation of Q(α) vs $T_{1/2}(\alpha)$ for ^{155}Lu and ^{157}Lu, one gets $T_{1/2}(\alpha)$=550 min for ^{159}Lu, which corresponds to %α=0.04. Gross β decay calculations (1973Ta30) give $T_{1/2}(\varepsilon)$=10 to 15 sec, which is consistent with a small α branch. The calculated half-lives of 1997Mo25 are 18 s for β and 1.8×10^4 s for α, which corresponds to %α=0.1%; this value is adopted. Decay identified by measurement of Yb K x ray from mass-separated source.
x[#]	(11/2$^-$)		B	J$^\pi$: Assignment is based (1995Ma46) on the systematics of the 15/2$^-$ to 11/2$^-$ transition energies for the odd-mass Lu, Tm, and Ho isotopes which suggest that the 426-keV energy is reasonable for this placement of this γ.
382.8+x[@]	(13/2$^-$)		B	
426.0+x[#]	(15/2$^-$)		B	
912.1+x[@]	(17/2$^-$)		B	
977.5+x[#]	(19/2$^-$)		B	
1534.3+x[@]	(21/2$^-$)		B	
1619.4+x[#]	(23/2$^-$)		B	
1664.8+x[c]	(19/2$^+$)		B	
2131.9+x[c]	(23/2$^+$)		B	
2132.1+x[@]	(25/2$^-$)		B	
2327.7+x[#]	(27/2$^-$)		B	
2357.5+x[b]	(25/2$^+$)		B	
2591.2+x[c]	(27/2$^+$)		B	
2669.1+x[e]	(27/2$^+$)		B	
2801.4+x[d]	(29/2$^+$)		B	
2995.1+x[a]	(29/2$^-$)		B	
3058.7+x[b]	(29/2$^+$)		B	
3088.0+x[#]	(31/2$^-$)		B	
3153.6+x[e]	(31/2$^+$)		B	

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Adopted Levels, Gammas (continued)

^{159}Lu Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
3200.1+x&	(31/2⁻)	B	4346.4+x&	(39/2⁻)	B	5498.1+x*d*	(45/2⁺)	B
3359.0+x*d*	(33/2⁺)	B	4378.8+x*e*	(39/2⁺)	B	5713.5+x&	(47/2⁻)	B
3555.4+x*a*	(33/2⁻)	B	4680.3+x*d*	(41/2⁺)	B	5966.1+x*e*	(47/2⁺)	B
3749.7+x*e*	(35/2⁺)	B	4685.2+x*a*	(41/2⁻)	B	6370.4+x*d*	(49/2⁺)	B
3764.1+x&	(35/2⁻)	B	4987.2+x&	(43/2⁻)	B	6475.8+x&	(51/2⁻)	B
4002.0+x*d*	(37/2⁺)	B	5110.6+x*e*	(43/2⁺)	B			
4080.9+x*a*	(37/2⁻)	B	5353.5+x*a*	(45/2⁻)	B			

† Values for the excited states are taken from the high-spin data set.
‡ For excited levels, from assignments in the ^{144}Sm(^{19}F,4nγ) study (1995Ma46).
# Band(A): πh$_{11/2}$ band, α=−1/2. (Label=A$_p$). Dominant orbital is probably π7/2[523] (2009Sh48). Intersected by the aligned i$_{13/2}$ two-neutron-quasiparticle conf (label=AB) near ħω=0.34 MeV.
@ Band(a): πh$_{11/2}$ band, α=+1/2. (Label=B$_p$). See the comment on the α=−1/2 branch.
& Band(B): Aligned band, label=A$_p$AB, α=−1/2. See the notation given in the comment on the πh$_{11/2}$ band.
a Band(b): Aligned band, label=B$_p$AB, α=+1/2. See the notation given in the comment on the πh$_{11/2}$ band.
b Band(C): π=+, α=+1/2 band. Tentatively assigned by 2009Sh48 as an "unstable octupole vibration" built on πh11/2, α=+1/2 branch.
c Band(c): π=+, α=−1/2 band. Tentatively assigned by 2009Sh48 as an "unstable octupole vibration" built on πh11/2, α=−1/2 branch.
d Band(D): π=+ band,α=+1/2 branch.
e Band(d): π=+ band,α=−1/2 branch.

γ(^{159}Lu)

E$_i$(level)	J$_i^π$	Eγ	Iγ	E$_f$	J$_f^π$	Mult.
382.8+x	(13/2⁻)	382.8	100	x	(11/2⁻)	
426.0+x	(15/2⁻)	426.0	100	x	(11/2⁻)	
912.1+x	(17/2⁻)	486.2		426.0+x	(15/2⁻)	
		529.4		382.8+x	(13/2⁻)	
977.5+x	(19/2⁻)	551.3	100	426.0+x	(15/2⁻)	
1534.3+x	(21/2⁻)	556.7		977.5+x	(19/2⁻)	
		622.3		912.1+x	(17/2⁻)	
1619.4+x	(23/2⁻)	642.0	100	977.5+x	(19/2⁻)	
1664.8+x	(19/2⁺)	752.7	100	912.1+x	(17/2⁻)	D
2131.9+x	(23/2⁺)	467.1	100	1664.8+x	(19/2⁺)	
2132.1+x	(25/2⁻)	597.8	100	1534.3+x	(21/2⁻)	
2327.7+x	(27/2⁻)	708.3	100	1619.4+x	(23/2⁻)	
2357.5+x	(25/2⁺)	225.3		2131.9+x	(23/2⁺)	
		738.0		1619.4+x	(23/2⁻)	D
2591.2+x	(27/2⁺)	233.8	100	2357.5+x	(25/2⁺)	
2669.1+x	(27/2⁺)	311.6	100	2357.5+x	(25/2⁺)	
2801.4+x	(29/2⁺)	132.3		2669.1+x	(27/2⁺)	
		210.2		2591.2+x	(27/2⁺)	
2995.1+x	(29/2⁻)	403.9	100	2591.2+x	(27/2⁺)	
3058.7+x	(29/2⁺)	467.5		2591.2+x	(27/2⁺)	
		731.0		2327.7+x	(27/2⁻)	D
3088.0+x	(31/2⁻)	760.3	100	2327.7+x	(27/2⁻)	
3153.6+x	(31/2⁺)	352.3		2801.4+x	(29/2⁺)	

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Adopted Levels, Gammas (continued)

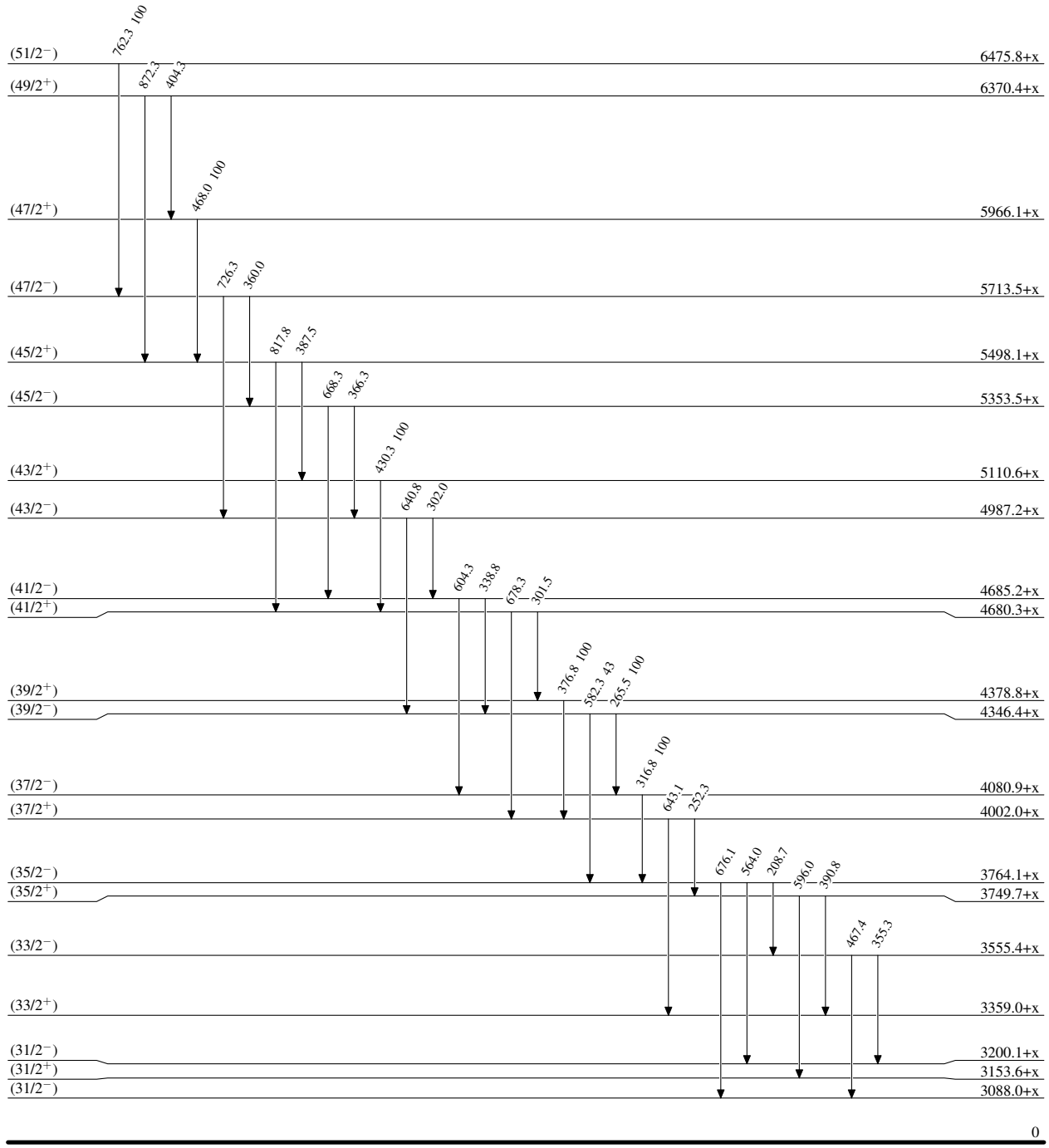
$\gamma(^{159}Lu)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
3153.6+x	$(31/2^+)$	484.4		2669.1+x	$(27/2^+)$	4378.8+x	$(39/2^+)$	376.8	100	4002.0+x	$(37/2^+)$
3200.1+x	$(31/2^-)$	205.0		2995.1+x	$(29/2^-)$	4680.3+x	$(41/2^+)$	301.5		4378.8+x	$(39/2^+)$
		872.4		2327.7+x	$(27/2^-)$			678.3		4002.0+x	$(37/2^+)$
3359.0+x	$(33/2^+)$	205.3		3153.6+x	$(31/2^+)$	4685.2+x	$(41/2^-)$	338.8		4346.4+x	$(39/2^-)$
		300.3		3058.7+x	$(29/2^+)$			604.3		4080.9+x	$(37/2^-)$
		557.6		2801.4+x	$(29/2^+)$	4987.2+x	$(43/2^-)$	302.0		4685.2+x	$(41/2^-)$
3555.4+x	$(33/2^-)$	355.3		3200.1+x	$(31/2^-)$			640.8		4346.4+x	$(39/2^-)$
		467.4		3088.0+x	$(31/2^-)$	5110.6+x	$(43/2^+)$	430.3	100	4680.3+x	$(41/2^+)$
3749.7+x	$(35/2^+)$	390.8		3359.0+x	$(33/2^+)$	5353.5+x	$(45/2^-)$	366.3		4987.2+x	$(43/2^-)$
		596.0		3153.6+x	$(31/2^+)$			668.3		4685.2+x	$(41/2^-)$
3764.1+x	$(35/2^-)$	208.7		3555.4+x	$(33/2^-)$	5498.1+x	$(45/2^+)$	387.5		5110.6+x	$(43/2^+)$
		564.0		3200.1+x	$(31/2^-)$			817.8		4680.3+x	$(41/2^+)$
		676.1		3088.0+x	$(31/2^-)$	5713.5+x	$(47/2^-)$	360.0		5353.5+x	$(45/2^-)$
4002.0+x	$(37/2^+)$	252.3		3749.7+x	$(35/2^+)$			726.3		4987.2+x	$(43/2^-)$
		643.1		3359.0+x	$(33/2^+)$	5966.1+x	$(47/2^+)$	468.0	100	5498.1+x	$(45/2^+)$
4080.9+x	$(37/2^-)$	316.8	100	3764.1+x	$(35/2^-)$	6370.4+x	$(49/2^+)$	404.3		5966.1+x	$(47/2^+)$
4346.4+x	$(39/2^-)$	265.5	100 *12*	4080.9+x	$(37/2^-)$			872.3		5498.1+x	$(45/2^+)$
		582.3	43 *5*	3764.1+x	$(35/2^-)$	6475.8+x	$(51/2^-)$	762.3	100	5713.5+x	$(47/2^-)$

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

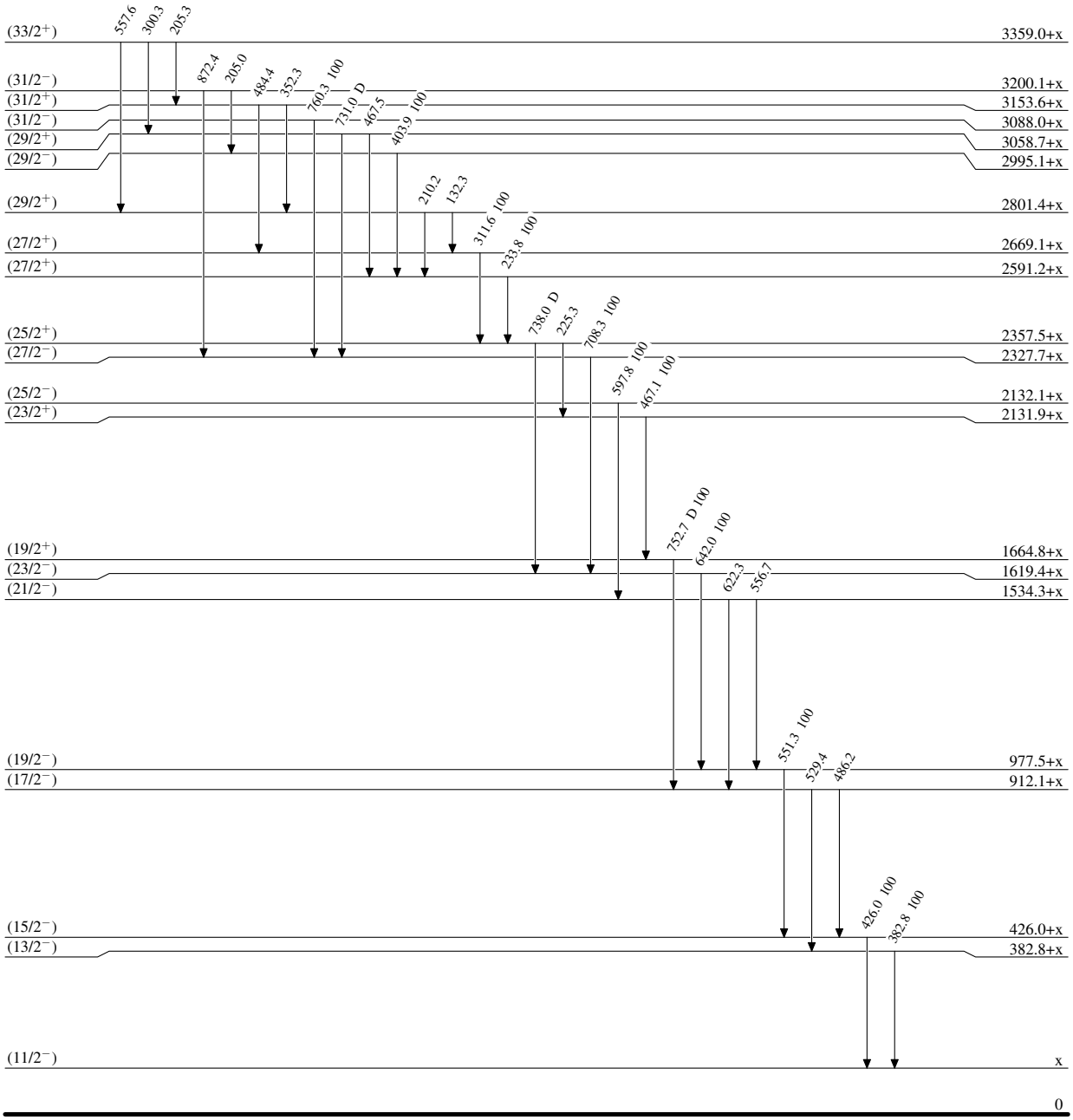


$^{159}_{71}Lu_{88}$

Adopted Levels, Gammas

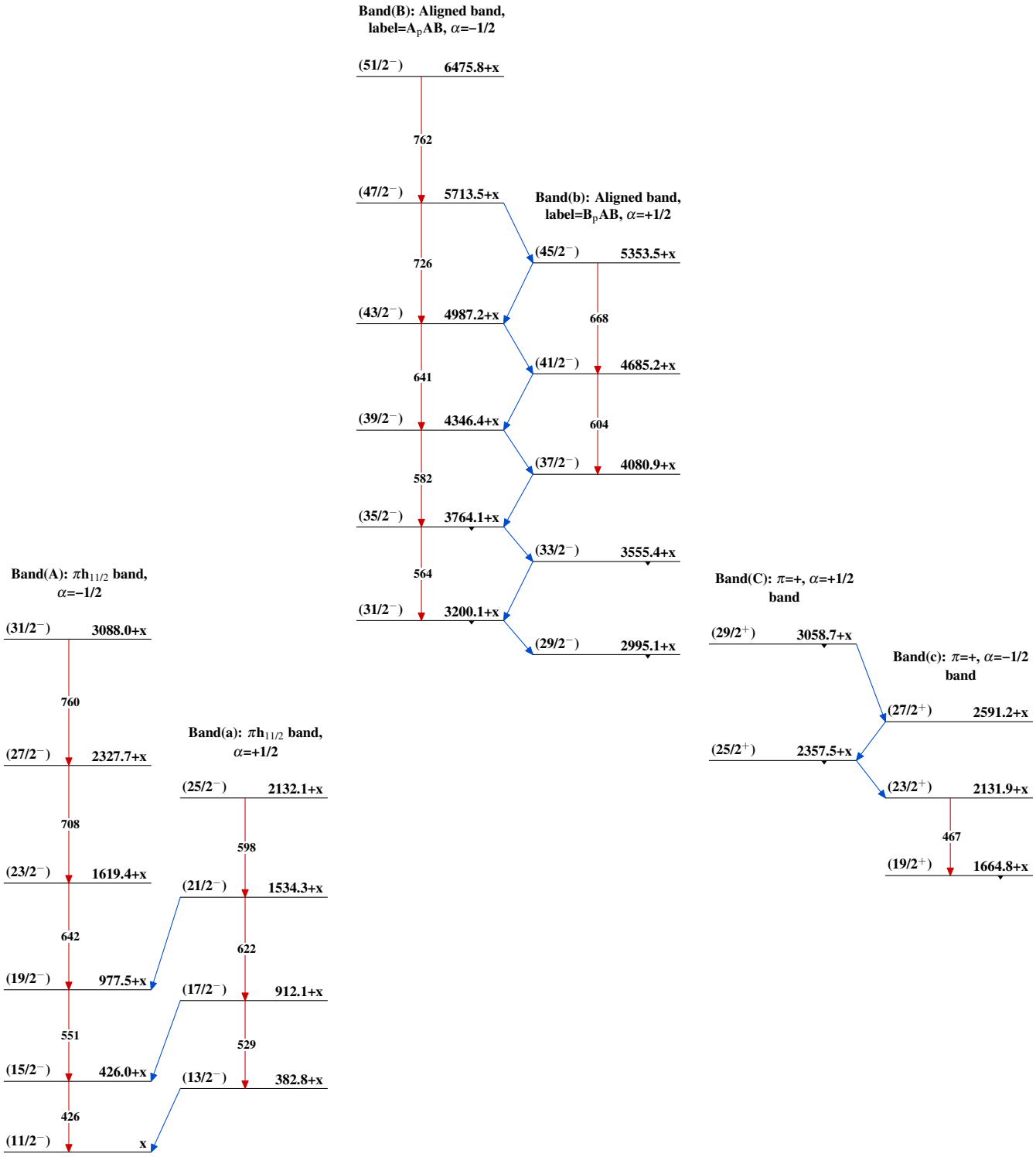
Level Scheme (continued)

Intensities: Relative photon branching from each level

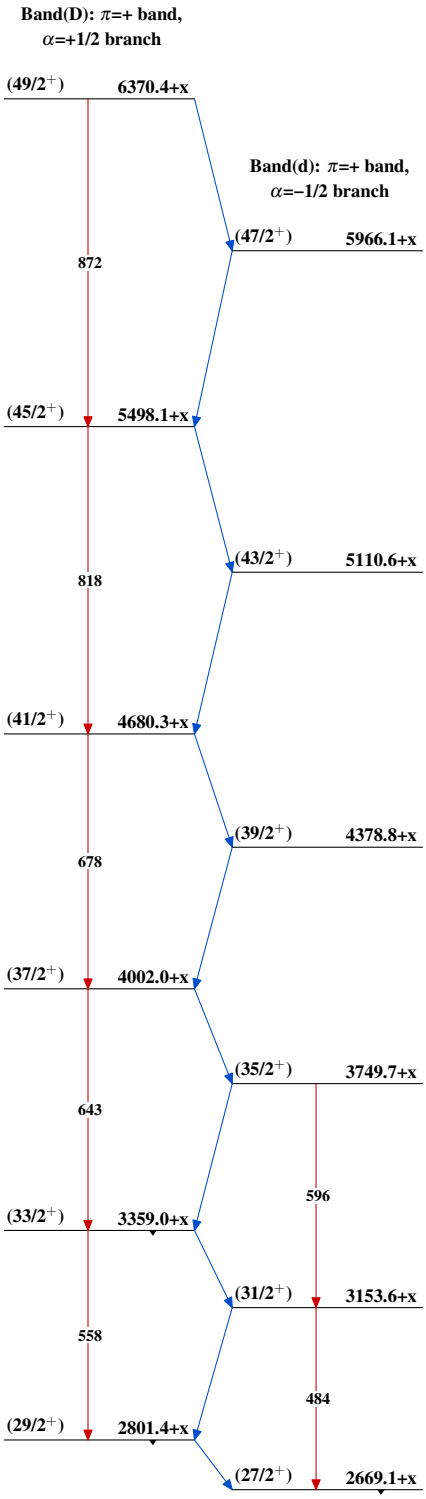


$^{159}_{71}Lu_{88}$

Adopted Levels, Gammas



Adopted Levels, Gammas (continued)



$^{159}_{71}Lu_{88}$