Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Dec-2015

Q(β^-)=−4280 *40*; S(n)=8350 *50*; S(p)=1730 *50*; Q(α)=4440 *50* 2012Wa38
S(2n)=18750 *50*, S(2p)=5970 *50*, Q(εp)=2900 *50* (2012Wa38).
Mass measurement: 2000Ra23.
Nuclear structure calculations: 1991Ba31.

^{172}Re Levels

High-spin level scheme given here is essentially from 2014Ha22, except two bands which were reported only by 2010Zh26 as bands 5 and 6. On request by the evaluator on Dec 17, 2015, D.J. Hartley (first author of 2014Ha22) searched for these bands in the Gammasphere data obtained at ATLAS-ANL, and concluded that the bands 5 and 6 reported in 2010Zh26 were present in his data, although band 5 was extremely weak. However, none of these two bands could be connected to the main structures reported in their work 2014Ha22, thus making it difficult for a confirmed assignment to ^{172}Re.

A, B, C and D correspond to first, second, third and fourth lowest $i_{13/2}$ quasineutrons.

Cross Reference (XREF) Flags

A	^{172}Os ε decay (19.2 s)
B	^{176}Ir α decay (8.6 s)
C	^{149}Sm(^{27}Al,4nγ)
D	^{120}Sn(^{55}Mn,3nγ)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
0+x	(5$^+$)	15 s *3*	B	%ε+%β^+=100 %α≤0.0003 (from α syst). E(level): from theoretical calculations by 2005Wa25, (5$^+$) is likely the ground state of ^{172}Re. This level may correspond to 0+z or 0+u in high-spin structures. J^{π}: favored α transition from (5$^+$) ^{176}Ir parent; probable ε feeding of 4$^+$ and 6$^+$ levels in ^{172}W. $T_{1/2}$: from 1977Be66. Others (probably mixture of two activities): 23 s (1975St02), 30 s *5* (1974Be59), 36 s *12* (1973Be67), 48 s *12* (1972Be89).
0+y	(2)	55 s *5*	A	%ε+%β^+=100 Additional information 1. %α≤0.001 (from α syst). E(level): 0 *100* (from systematics, 2012Au07). J^{π}: probable ε feeding of 2$^+$ and 4$^+$ levels in ^{172}W, no ε feeding of levels in ^{172}W with J>4. $T_{1/2}$: from 1977Be66.
63.06+y *19*	(1)		A	J^{π}: (E1) γ to (2); possible allowed ε+β^+ feeding from 0$^+$ parent.
161.5+y *5*	#		A	
169.9+y *5*	#		A	
185.1+y *5*	#		A	
239.78+y *17*	(0,1)#		A	J^{π}: possible allowed ε+β^+ feeding from 0$^+$ parent.
274.2+y *5*	#		A	
291.49+y *25*	#		A	
360.5+y *5*	#		A	
906.4+y *11*	#		A	
0+z			D	Additional information 2.
51.7+z *17*			D	

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Adopted Levels, Gammas (continued)

^{172}Re Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF
194.6+z[@] *15*	(4$^+$)	D
223+z[&]	(5$^+$)	D
292.6+z[@] *14*	(6$^+$)	CD
381.0+z *10*		D
389.7+z[&] *14*	(7$^+$)	CD
501.0+z[@] *13*	(8$^+$)	CD
646.0+z[&] *13*	(9$^+$)	CD
806.2+z[@] *13*	(10$^+$)	CD
991.8+z[&] *14*	(11$^+$)	CD
1196.4+z[@] *14*	(12$^+$)	CD
1408.9+z[&] *14*	(13$^+$)	CD
1650.4+z[@] *15*	(14$^+$)	CD
1870.1+z[&] *15*	(15$^+$)	CD
2128.6+z[@] *15*	(16$^+$)	CD
2175.5+z[a] *15*	(16$^+$)	CD
2358.8+z[&] *15*	(17$^+$)	CD
2411.9+z[b] *17*	(17$^+$)	D
2618.5+z[@] *15*	(18$^+$)	CD
2708.2+z[a] *16*	(18$^+$)	CD
2875.0+z[&] *15*	(19$^+$)	CD
2922.2+z[b] *17*	(19$^+$)	D
3175.1+z[@] *16*	(20$^+$)	CD
3290.4+z[a] *17*	(20$^+$)	D
3445.3+z[&] *16*	(21$^+$)	CD
3495.1+z[b] *17*	(21$^+$)	D
3794.7+z[@] *16*	(22$^+$)	CD
3917.4+z[a] *19*	(22$^+$)	D
4072.3+z[&] *19*	(23$^+$)	D
4127.1+z[b] *20*	(23$^+$)	D
4471.3+z[@] *17*	(24$^+$)	CD
4595.4+z[a] *22*	(24$^+$)	D
4746.3+z[&] *21*	(25$^+$)	D
4819.1+z[b] *22*	(25$^+$)	D
5203.5+z[@] *18*	(26$^+$)	CD
5325.4+z[a] *24*	(26$^+$)	D
5455.3+z[&] *24*	(27$^+$)	D
5572.1+z[b] *25*	(27$^+$)	D
5993.5+z[@] *21*	(28$^+$)	D
6199+z[&] *3*	(29$^+$)	D
6384+z[b] *3*	(29$^+$)	D
6839.5+z[@] *23*	(30$^+$)	D
6991+z[&] *3*	(31$^+$)	D
7247+z[b] *3*	(31$^+$)	D
7736.5+z[@] *25*	(32$^+$)	D
7846+z[&] *3*	(33$^+$)	D
8143+z[b] *3*	(33$^+$)	D

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Adopted Levels, Gammas (continued)

^{172}Re Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
8680+z[@] 3	(34^{+})	D	
8768+z[&] 3	(35^{+})	D	
9071+z[b] 4	(35^{+})	D	
9675+z[@] 3	(36^{+})	D	
9757+z[&] 4	(37^{+})	D	
10805+z[&] 4	(39^{+})	D	
0+u	(8^{+})	D	Additional information 3. J$^{\pi}$: proposed by 2010Zh26 and 2003Zh38.
96.4+u[c] 17	(6^{-})	CD	
185.5+u[f] 5	(9^{-})	CD	
187.4+u[d] 17	(7^{-})	CD	
214.4+u[c] 17	(8^{-})	CD	
281.1+u[e] 7	(10^{-})	CD	
364.4+u[d] 17	(9^{-})	CD	
408.2+u[c] 16	(10^{-})	CD	
420.0+u[f] 9	(11^{-})	CD	
605.6+u[e] 10	(12^{-})	CD	
621.9+u[d] 16	(11^{-})	CD	
706.3+u[c] 16	(12^{-})	CD	
820.2+u[f] 10	(13^{-})	CD	
968.0+u[d] 16	(13^{-})	CD	
1072.2+u[e] 10	(14^{-})	CD	
1113.0+u[c] 16	(14^{-})	CD	
1340.7+u[f] 10	(15^{-})	CD	
1401.1+u[d] 16	(15^{-})	CD	
1614.7+u[c] 15	(16^{-})	CD	
1637.1+u[e] 11	(16^{-})	CD	
1912.6+u[d] 15	(17^{-})	CD	
1942.6+u[f] 11	(17^{-})	CD	
2194.6+u[c] 15	(18^{-})	CD	
2262.6+u[e] 11	(18^{-})	CD	
2489.3+u[d] 15	(19^{-})	CD	
2589.1+u[f] 11	(19^{-})	CD	
2834.2+u[c] 14	(20^{-})	CD	
2914.9+u[e] 12	(20^{-})	CD	
3115.9+u[d] 15	(21^{-})	CD	
3241.4+u[f] 12	(21^{-})	CD	
3518.8+u[c] 14	(22^{-})	CD	
3554.5+u[e] 12	(22^{-})	CD	
3780.7+u[d] 15	(23^{-})	CD	
3874.6+u[f] 12	(23^{-})	CD	
4194.6+u[e] 13	(24^{-})	CD	
4255.6+u[c] 14	(24^{-})	CD	
4481.7+u[d] 16	(25^{-})	CD	
4554.6+u[f] 14	(25^{-})	D	
4912.6+u[e] 15	(26^{-})	D	
5026.1+u[c] 15	(26^{-})	CD	

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Adopted Levels, Gammas (continued)

^{172}Re Levels (continued)

E(level)†	Jπ‡	XREF	Comments
5225.2+u[d] 17	(27⁻)	CD	
5312.6+u[f] 16	(27⁻)	D	
5707.6+u[e] 16	(28⁻)	D	
5836.1+u[c] 18	(28⁻)	D	
6022.2+u[d] 20	(29⁻)	D	
6145.7+u[f] 17	(29⁻)	D	
6573.4+u[e] 17	(30⁻)	D	
6693.1+u[c] 21	(30⁻)	D	
6879.3+u[d] 22	(31⁻)	D	
7048.1+u[f] 18	(31⁻)	D	
7505.4+u[e] 20	(32⁻)	D	
7595.1+u[c] 23	(32⁻)	D	
7796.3+u[d] 24	(33⁻)	D	
8014.1+u[f] 21	(33⁻)	D	
8495.4+u[e] 23	(34⁻)	D	
8515.1+u[c] 25	(34⁻)	D	
8771+u[d] 3	(35⁻)	D	
9463+u[c] 3	(36⁻)	D	
9792+u[d] 3	(37⁻)	D	
9807+u 3		D	
10452+u[c] 3	(38⁻)	D	
10834+u[d] 3	(39⁻)	D	
0+v[g]	(7⁺)	C	Additional information 4.
193.7+v[h] 4	(8⁺)	C	
413.1+v[g] 4	(9⁺)	C	
658.8+v[h] 5	(10⁺)	C	
845.1+v[i] 7	(10⁺)	C	
898.3+v[g] 6	(11⁺)	C	
1020.1+v[j] 8	(11⁺)	C	
1133.1+v[h] 6	(12⁺)	C	
1216.5+v[i] 8	(12⁺)	C	
1365.3+v[g] 6	(13⁺)	C	
1433.3+v[j] 9	(13⁺)	C	
1626.4+v[h] 7	(14⁺)	C	
1675.8+v[i] 9	(14⁺)	C	
1883.2+v[g] 7	(15⁺)	C	
1943.5+v[j] 9	(15⁺)	C	
2161.9+v[h] 9	(16⁺)	C	
2237.5+v[i] 10	(16⁺)	C	
2445.7+v[g] 9	(17⁺)	C	
2552.9+v[j] 10	(17⁺)	C	
2890.8+v[i] 10	(18⁺)	C	
3244.1+v[j] 10	(19⁺)	C	

† From least-squares fit to Eγ values.

‡ As proposed in 2014Ha22 and 2010Zh26, based on angular asymmetry data in 2010Zh26 and 2003Zh38 for selected transitions, band structures, alignments, and comparison with structures of neighboring nuclides.

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Adopted Levels, Gammas (continued)

^{172}Re Levels (continued)

[#] Expected to be low spin (0,1,2$^-$) from possible direct $\varepsilon+\beta^+$ feeding from 0$^+$ parent ^{172}Os.
[@] Band(A): $\pi h_{9/2}\otimes\nu(f_{7/2}/h_{9/2}$,$\alpha$=0. 2010Zh26 propose Nilsson configuration=π1/2[541]$\otimes\nu$1/2[521]. Crossing at $\hbar\omega\approx$0.24 MeV due to $\hat{A}$B neutron alignment; second crossing at $\hbar\omega\approx$0.33 MeV.
[&] Band(a): $\pi h_{9/2}\otimes\nu(f_{7/2}/h_{9/2}$,$\alpha$=1. 2010Zh26 propose Nilsson configuration=π1/2[541]$\otimes\nu$1/2[521]. Crossing at $\hbar\omega\approx$0.24 MeV due to $\hat{A}$B neutron alignment.
[a] Band(B): $\pi h_{9/2}\otimes\nu(p_{3/2}$AB),$\alpha$=0. Band proposed in 2014Ha22; not reported in 2010Zh26.
[b] Band(C): Band based on (17$^+$). Band proposed in 2014Ha22; not reported in 2010Zh26.
[c] Band(D): $\pi h_{9/2}\otimes\nu i_{13/2}$,$\alpha$=0. 2010Zh26 propose Nilsson configuration of 1/2[541] for $\pi h_{9/2}$. Semi-decoupled structure. Crossing at $\hbar\omega\approx$0.38 MeV due to AD neutron alignment, higher frequency crossing at $\hbar\omega\approx$0.5 MeV.
[d] Band(d): $\pi h_{9/2}\otimes\nu i_{13/2}$,$\alpha$=1. 2010Zh26 propose Nilsson configuration of 1/2[541] for $\pi h_{9/2}$. Crossing at $\hbar\omega\approx$0.34 MeV.
[e] Band(E): $\pi h_{11/2}\otimes\nu i_{13/2}$,$\alpha$=0. 2010Zh26 propose Nilsson configuration of 9/2[514] for $\pi h_{11/2}$. Crossing at $\hbar\omega\approx$0.30 MeV due to $\hat{B}$C neutron alignment.
[f] Band(e): $\pi h_{11/2}\otimes\nu i_{13/2}$,$\alpha$=1. 2010Zh26 propose Nilsson configuration of 9/2[514] for $\pi h_{11/2}$. Crossing at $\hbar\omega\approx$0.30 MeV due to $\hat{B}$C neutron alignment.
[g] Band(F): π9/2[514]$\otimes\nu$5/2[512],α=1. Band proposed in 2010Zh26. Band very weakly present in 2014Ha22 data but not connected to the main structure (priv. comm. from D.J. Hartley Dec 17, 2015).
[h] Band(f): π9/2[514]$\otimes\nu$5/2[512],α=0. Band proposed in 2010Zh26. See comment for its signature partner.
[i] Band(G): π5/2[402]$\otimes\nu i_{13/2}$,α=0. Band proposed in 2010Zh26. Band present in 2014Ha22 data but not connected to the main structure (priv. comm. from D.J. Hartley Dec 17, 2015).
[j] Band(g): π5/2[402]$\otimes\nu i_{13/2}$,α=1. Band proposed in 2010Zh26. See comment for its signature partner.

γ(^{172}Re)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	α[&]
63.06+y	(1)	63.0 3	100	0+y	(2)	(E1)	0.25
161.5+y		98.4[@] 4	100	63.06+y	(1)		
169.9+y		106.8 4	100	63.06+y	(1)		
185.1+y		122.0 4	100	63.06+y	(1)		
239.78+y	(0,1)	176.7 2	100 15	63.06+y	(1)		
		239.8 2	93 18	0+y	(2)		
274.2+y		211.1 4	100	63.06+y	(1)		
291.49+y		228.4 4	≈36	63.06+y	(1)		
		291.5 3	100 22	0+y	(2)		
360.5+y		120.7 4	100	239.78+y	(0,1)		
906.4+y		843.3 10	100	63.06+y	(1)		
292.6+z	(6$^+$)	98.0[@] 5	100	194.6+z	(4$^+$)		
381.0+z		381		0+z			
389.7+z	(7$^+$)	166.2[b] 5		223+z	(5$^+$)		
		338		51.7+z			
501.0+z	(8$^+$)	111		389.7+z	(7$^+$)		
		120		381.0+z			
		208.4 5	100	292.6+z	(6$^+$)	Q	
646.0+z	(9$^+$)	145		501.0+z	(8$^+$)		
		256.4 5		389.7+z	(7$^+$)		
		265		381.0+z			
806.2+z	(10$^+$)	160		646.0+z	(9$^+$)		
		305.1 5	100	501.0+z	(8$^+$)	Q	
991.8+z	(11$^+$)	346.0 5		646.0+z	(9$^+$)		
1196.4+z	(12$^+$)	390.0 5	100	806.2+z	(10$^+$)	Q	
1408.9+z	(13$^+$)	417.3 5		991.8+z	(11$^+$)		
1650.4+z	(14$^+$)	453.8 5	100	1196.4+z	(12$^+$)	Q	
1870.1+z	(15$^+$)	461.3 5		1408.9+z	(13$^+$)		

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Adopted Levels, Gammas (continued)

$\gamma(^{172}Re)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]
2128.6+z	(16$^+$)	477.9 *5*	100	1650.4+z	(14$^+$)	Q
2175.5+z	(16$^+$)	525.3 *5*		1650.4+z	(14$^+$)	Q
2358.8+z	(17$^+$)	488.9 *5*		1870.1+z	(15$^+$)	
2411.9+z	(17$^+$)	283		2128.6+z	(16$^+$)	D
2618.5+z	(18$^+$)	489.9 *5*	100	2128.6+z	(16$^+$)	Q
2708.2+z	(18$^+$)	532.8 *5*	100	2175.5+z	(16$^+$)	
		579		2128.6+z	(16$^+$)	
2875.0+z	(19$^+$)	256		2618.5+z	(18$^+$)	
		516.3 *5*		2358.8+z	(17$^+$)	
2922.2+z	(19$^+$)	304		2618.5+z	(18$^+$)	
		510		2411.9+z	(17$^+$)	
3175.1+z	(20$^+$)	556.5 *5*	100	2618.5+z	(18$^+$)	Q
3290.4+z	(20$^+$)	582		2708.2+z	(18$^+$)	
		672		2618.5+z	(18$^+$)	
3445.3+z	(21$^+$)	270		3175.1+z	(20$^+$)	
		570.4 *5*		2875.0+z	(19$^+$)	
3495.1+z	(21$^+$)	320		3175.1+z	(20$^+$)	
		573		2922.2+z	(19$^+$)	
3794.7+z	(22$^+$)	619.6 *5*	100	3175.1+z	(20$^+$)	
3917.4+z	(22$^+$)	627		3290.4+z	(20$^+$)	
4072.3+z	(23$^+$)	627		3445.3+z	(21$^+$)	
4127.1+z	(23$^+$)	632		3495.1+z	(21$^+$)	
4471.3+z	(24$^+$)	676.6 *5*	100	3794.7+z	(22$^+$)	
4595.4+z	(24$^+$)	678		3917.4+z	(22$^+$)	
4746.3+z	(25$^+$)	674		4072.3+z	(23$^+$)	
4819.1+z	(25$^+$)	692		4127.1+z	(23$^+$)	
5203.5+z	(26$^+$)	732.2 *5*	100	4471.3+z	(24$^+$)	
5325.4+z	(26$^+$)	730		4595.4+z	(24$^+$)	
5455.3+z	(27$^+$)	709		4746.3+z	(25$^+$)	
5572.1+z	(27$^+$)	753		4819.1+z	(25$^+$)	
5993.5+z	(28$^+$)	790		5203.5+z	(26$^+$)	
6199+z	(29$^+$)	744		5455.3+z	(27$^+$)	
6384+z	(29$^+$)	812		5572.1+z	(27$^+$)	
6839.5+z	(30$^+$)	846		5993.5+z	(28$^+$)	
6991+z	(31$^+$)	792		6199+z	(29$^+$)	
7247+z	(31$^+$)	863		6384+z	(29$^+$)	
7736.5+z	(32$^+$)	897		6839.5+z	(30$^+$)	
7846+z	(33$^+$)	855		6991+z	(31$^+$)	
8143+z	(33$^+$)	896		7247+z	(31$^+$)	
8680+z	(34$^+$)	944		7736.5+z	(32$^+$)	
8768+z	(35$^+$)	922		7846+z	(33$^+$)	
9071+z	(35$^+$)	928		8143+z	(33$^+$)	
9675+z	(36$^+$)	995		8680+z	(34$^+$)	
9757+z	(37$^+$)	989		8768+z	(35$^+$)	
10805+z	(39$^+$)	1048		9757+z	(37$^+$)	
185.5+u	(9$^-$)	185.5[a] *5*	100	0+u	(8$^+$)	D
187.4+u	(7$^-$)	90.9 *5*	100	96.4+u	(6$^-$)	D+Q
214.4+u	(8$^-$)	118.0 *5*	100	96.4+u	(6$^-$)	Q
281.1+u	(10$^-$)	95.6 *5*	100	185.5+u	(9$^-$)	D+Q
364.4+u	(9$^-$)	149.9 *5*	100	214.4+u	(8$^-$)	D
		177.0 *5*	25 *3*	187.4+u	(7$^-$)	
408.2+u	(10$^-$)	193.8 *5*	100	214.4+u	(8$^-$)	Q
420.0+u	(11$^-$)	138.9 *5*	100	281.1+u	(10$^-$)	D+Q
605.6+u	(12$^-$)	185.5[a] *5*	100	420.0+u	(11$^-$)	D
621.9+u	(11$^-$)	213.8 *5*	100	408.2+u	(10$^-$)	D
		257.5 *5*	51 *5*	364.4+u	(9$^-$)	Q

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Adopted Levels, Gammas (continued)

$\gamma(^{172}Re)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ‡	E_f	J^π_f	Mult.#
706.3+u	(12⁻)	298.0 *5*	100	408.2+u	(10⁻)	Q
820.2+u	(13⁻)	214.6 *5*	100	605.6+u	(12⁻)	D+Q
		400.3 *5*	39 *4*	420.0+u	(11⁻)	Q
968.0+u	(13⁻)	261.7 *5*	100	706.3+u	(12⁻)	D
		346.2 *5*	76 *7*	621.9+u	(11⁻)	Q
1072.2+u	(14⁻)	251.9 *5*	100	820.2+u	(13⁻)	D+Q
		466.7 *5*	59 *6*	605.6+u	(12⁻)	Q
1113.0+u	(14⁻)	406.7 *5*	100	706.3+u	(12⁻)	Q
1340.7+u	(15⁻)	268.4 *5*	100	1072.2+u	(14⁻)	D+Q
		520.5 *5*	79 *8*	820.2+u	(13⁻)	Q
1401.1+u	(15⁻)	288.1 *5*	60 *7*	1113.0+u	(14⁻)	D
		329[b]		1072.2+u	(14⁻)	
		433.1 *5*	100	968.0+u	(13⁻)	Q
1614.7+u	(16⁻)	501.7 *5*	100	1113.0+u	(14⁻)	Q
1637.1+u	(16⁻)	296.4 *5*	100	1340.7+u	(15⁻)	D+Q
		564.8 *5*	93 *9*	1072.2+u	(14⁻)	Q
1912.6+u	(17⁻)	298.0 *5*	≤51	1614.7+u	(16⁻)	
		511.5 *5*	≥100	1401.1+u	(15⁻)	
1942.6+u	(17⁻)	305.5 *5*	70 *7*	1637.1+u	(16⁻)	
		601.9 *5*	100	1340.7+u	(15⁻)	
2194.6+u	(18⁻)	579.9 *5*	100	1614.7+u	(16⁻)	Q
2262.6+u	(18⁻)	320.0 *5*	100	1942.6+u	(17⁻)	
		625.6 *5*	94 *10*	1637.1+u	(16⁻)	
2489.3+u	(19⁻)	294.8 *5*	≤23	2194.6+u	(18⁻)	
		576.7 *5*	≥100	1912.6+u	(17⁻)	Q
2589.1+u	(19⁻)	326.5 *5*	100	2262.6+u	(18⁻)	
		646.5 *5*	80	1942.6+u	(17⁻)	
2834.2+u	(20⁻)	639.5 *5*	100	2194.6+u	(18⁻)	
2914.9+u	(20⁻)	325.8 *5*	100	2589.1+u	(19⁻)	
		652.3 *5*	90	2262.6+u	(18⁻)	
3115.9+u	(21⁻)	281.7 *5*	26	2834.2+u	(20⁻)	
		626.7 *5*	100	2489.3+u	(19⁻)	
3241.4+u	(21⁻)	326.5 *5*	74	2914.9+u	(20⁻)	
		652.3 *5*	100	2589.1+u	(19⁻)	
3518.8+u	(22⁻)	684.7 *5*	100	2834.2+u	(20⁻)	
3554.5+u	(22⁻)	313.0 *5*	72	3241.4+u	(21⁻)	
		639.5 *5*	100	2914.9+u	(20⁻)	
		720		2834.2+u	(20⁻)	
3780.7+u	(23⁻)	664.8 *5*	100	3115.9+u	(21⁻)	
3874.6+u	(23⁻)	320.0 *5*	100	3554.5+u	(22⁻)	
		633.3 *5*	71	3241.4+u	(21⁻)	
4194.6+u	(24⁻)	320		3874.6+u	(23⁻)	
		640		3554.5+u	(22⁻)	
		676		3518.8+u	(22⁻)	
4255.6+u	(24⁻)	701		3554.5+u	(22⁻)	
		736.8 *5*	100	3518.8+u	(22⁻)	
4481.7+u	(25⁻)	701.0 *5*	100	3780.7+u	(23⁻)	
4554.6+u	(25⁻)	360		4194.6+u	(24⁻)	
		680		3874.6+u	(23⁻)	
4912.6+u	(26⁻)	358		4554.6+u	(25⁻)	
		718		4194.6+u	(24⁻)	
5026.1+u	(26⁻)	770.5 *5*	100	4255.6+u	(24⁻)	
5225.2+u	(27⁻)	743.5 *5*	100	4481.7+u	(25⁻)	
5312.6+u	(27⁻)	400		4912.6+u	(26⁻)	
		758		4554.6+u	(25⁻)	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

$\gamma(^{172}Re)$ (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	E_f	J^{π}_f
5707.6+u	(28⁻)	395	5312.6+u	(27⁻)
		795	4912.6+u	(26⁻)
5836.1+u	(28⁻)	810	5026.1+u	(26⁻)
6022.2+u	(29⁻)	797	5225.2+u	(27⁻)
6145.7+u	(29⁻)	438	5707.6+u	(28⁻)
		833	5312.6+u	(27⁻)
6573.4+u	(30⁻)	428	6145.7+u	(29⁻)
		866	5707.6+u	(28⁻)
6693.1+u	(30⁻)	857	5836.1+u	(28⁻)
6879.3+u	(31⁻)	857	6022.2+u	(29⁻)
7048.1+u	(31⁻)	475	6573.4+u	(30⁻)
		902	6145.7+u	(29⁻)
7505.4+u	(32⁻)	932	6573.4+u	(30⁻)
7595.1+u	(32⁻)	902	6693.1+u	(30⁻)
7796.3+u	(33⁻)	917	6879.3+u	(31⁻)
8014.1+u	(33⁻)	966	7048.1+u	(31⁻)
8495.4+u	(34⁻)	990	7505.4+u	(32⁻)
8515.1+u	(34⁻)	920	7595.1+u	(32⁻)
8771+u	(35⁻)	975	7796.3+u	(33⁻)
9463+u	(36⁻)	948	8515.1+u	(34⁻)
9792+u	(37⁻)	1021	8771+u	(35⁻)
9807+u		1036	8771+u	(35⁻)
10452+u	(38⁻)	989	9463+u	(36⁻)
10834+u	(39⁻)	1042	9792+u	(37⁻)
193.7+v	(8⁺)	193.5 *5*	0+v	(7⁺)
413.1+v	(9⁺)	219.1 *5*	193.7+v	(8⁺)
		413.3 *5*	0+v	(7⁺)
658.8+v	(10⁺)	245.6 *5*	413.1+v	(9⁺)
		465.1 *5*	193.7+v	(8⁺)
845.1+v	(10⁺)	186.3 *5*	658.8+v	(10⁺)
898.3+v	(11⁺)	239.2 *5*	658.8+v	(10⁺)
		485.3 *5*	413.1+v	(9⁺)
1020.1+v	(11⁺)	174.8 *5*	845.1+v	(10⁺)
1133.1+v	(12⁺)	234.7 *5*	898.3+v	(11⁺)
		474.4 *5*	658.8+v	(10⁺)
1216.5+v	(12⁺)	196.3 *5*	1020.1+v	(11⁺)
		371.5 *5*	845.1+v	(10⁺)
1365.3+v	(13⁺)	232.3 *5*	1133.1+v	(12⁺)
		467.0 *5*	898.3+v	(11⁺)
1433.3+v	(13⁺)	216.7 *5*	1216.5+v	(12⁺)
		413.2 *5*	1020.1+v	(11⁺)
1626.4+v	(14⁺)	260.9 *5*	1365.3+v	(13⁺)
		493.3 *5*	1133.1+v	(12⁺)
1675.8+v	(14⁺)	242.5 *5*	1433.3+v	(13⁺)
		459.5 *5*	1216.5+v	(12⁺)
1883.2+v	(15⁺)	256.6 *5*	1626.4+v	(14⁺)
		518.1 *5*	1365.3+v	(13⁺)
1943.5+v	(15⁺)	267.7 *5*	1675.8+v	(14⁺)
		510.0 *5*	1433.3+v	(13⁺)
2161.9+v	(16⁺)	535.5 *5*	1626.4+v	(14⁺)
2237.5+v	(16⁺)	293.8 *5*	1943.5+v	(15⁺)
		561.8 *5*	1675.8+v	(14⁺)
2445.7+v	(17⁺)	562.5 *5*	1883.2+v	(15⁺)
2552.9+v	(17⁺)	315.3 *5*	2237.5+v	(16⁺)
		609.5 *5*	1943.5+v	(15⁺)
2890.8+v	(18⁺)	337.8 *5*	2552.9+v	(17⁺)
		653.3 *5*	2237.5+v	(16⁺)
3244.1+v	(19⁺)	353.1 *5*	2890.8+v	(18⁺)
		691.4 *5*	2552.9+v	(17⁺)

† From $^{149}Sm(^{27}Al,4n\gamma)$ (2010Zh26 and 2003Zh38) when given to nearest tenth of a keV, otherwise from $^{120}Sn(^{55}Mn,3n\gamma)$ (2014Ha22).

‡ From $^{149}Sm(^{27}Al,4n\gamma)$ (2003Zh38).

From angular asymmetry measurement in $^{149}Sm(^{27}Al,4n\gamma)$ (2003Zh38). Mult=Q indicates ΔJ=2 (most likely E2) and mult=D indicates ΔJ=1, dipole (most likely M1 or M1+E2 in a coupled band).

@ The 98.0 *5* gamma in high-spin reactions seems different from a 98.4 *4* gamma seen in ^{172}Os ε decay due to different spins expected for the levels involved.

& Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

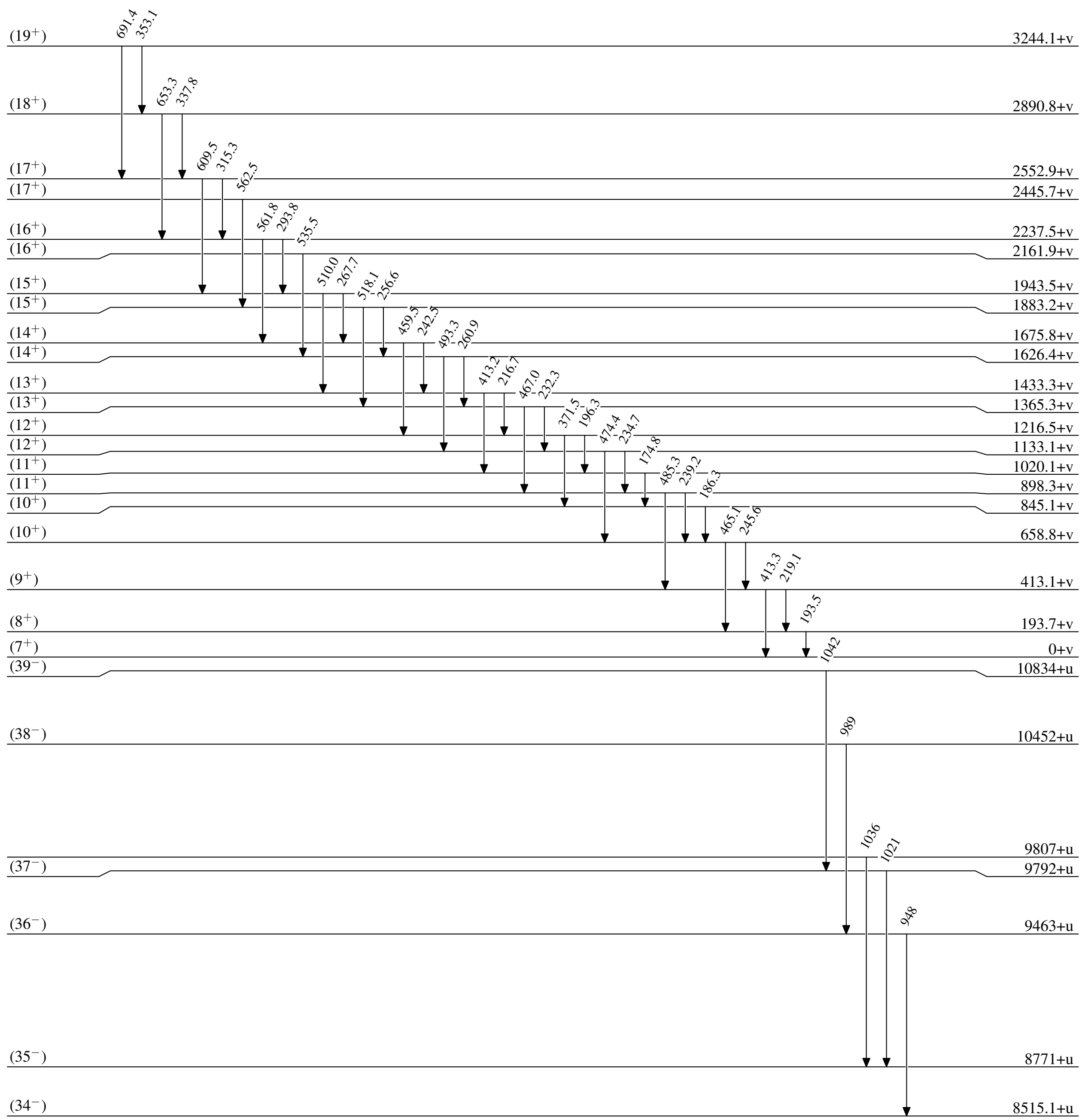
[a] Multiply placed.

[b] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

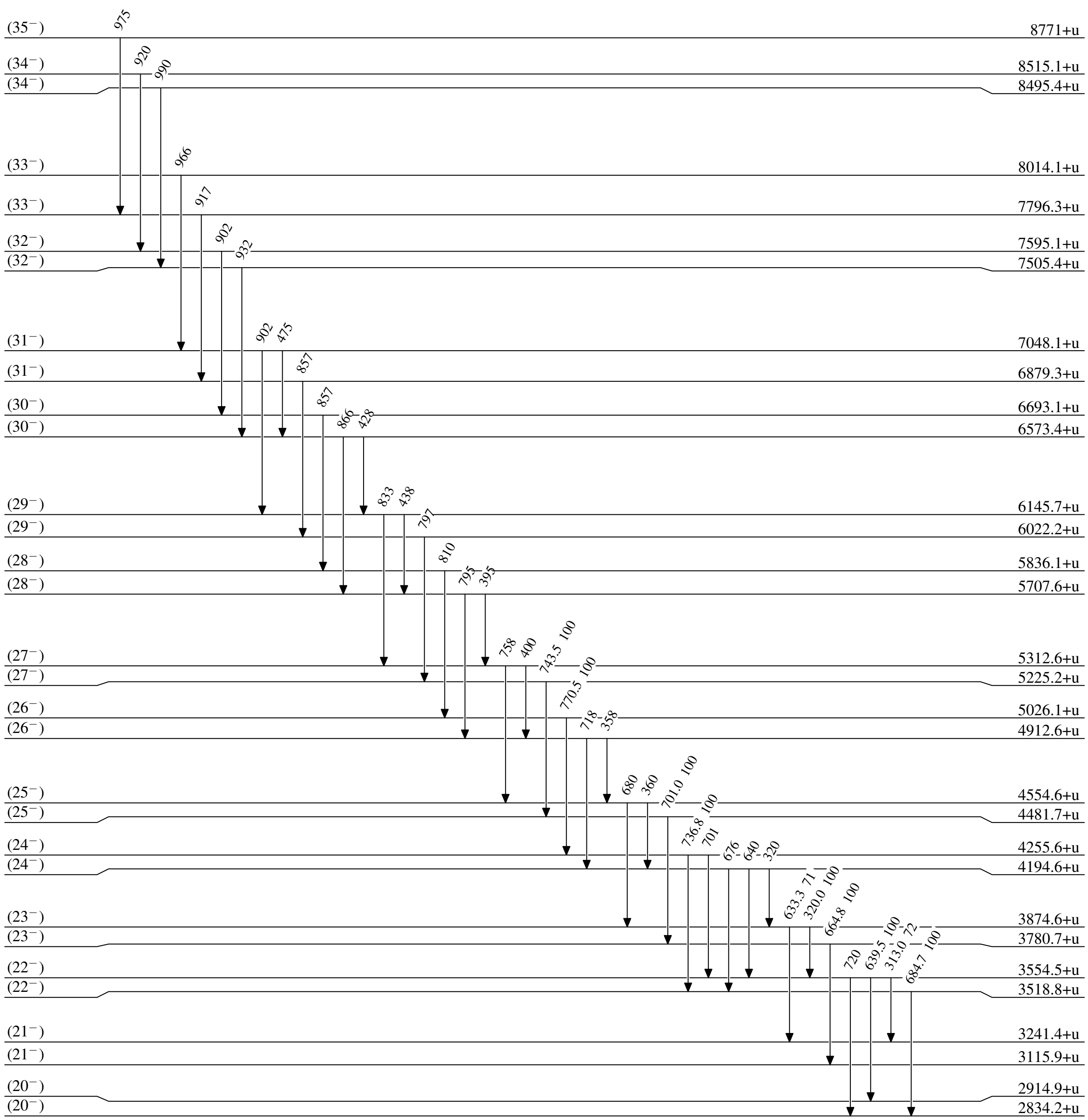


$^{172}_{75}Re_{97}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{172}_{75}Re_{97}$

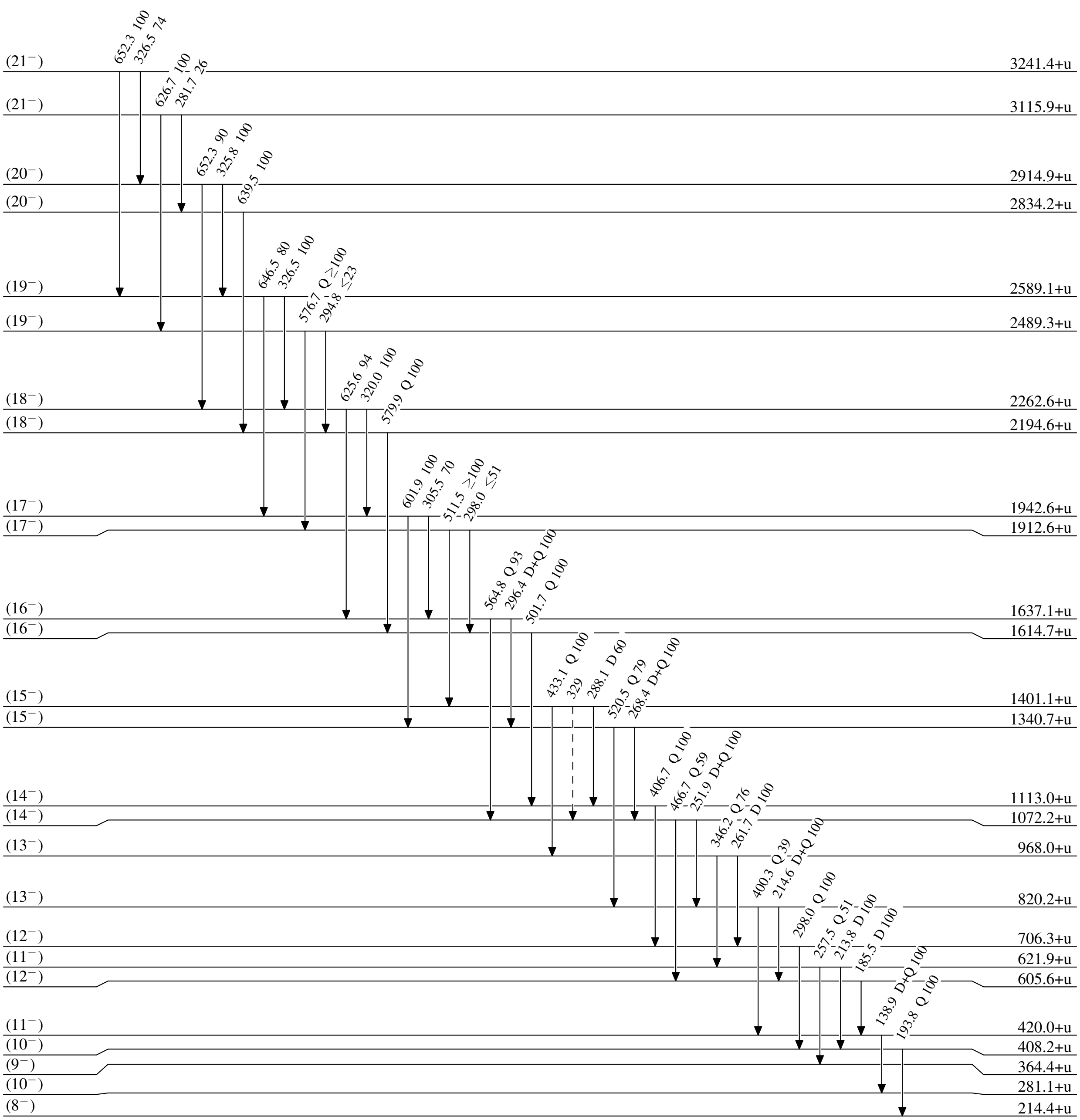
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

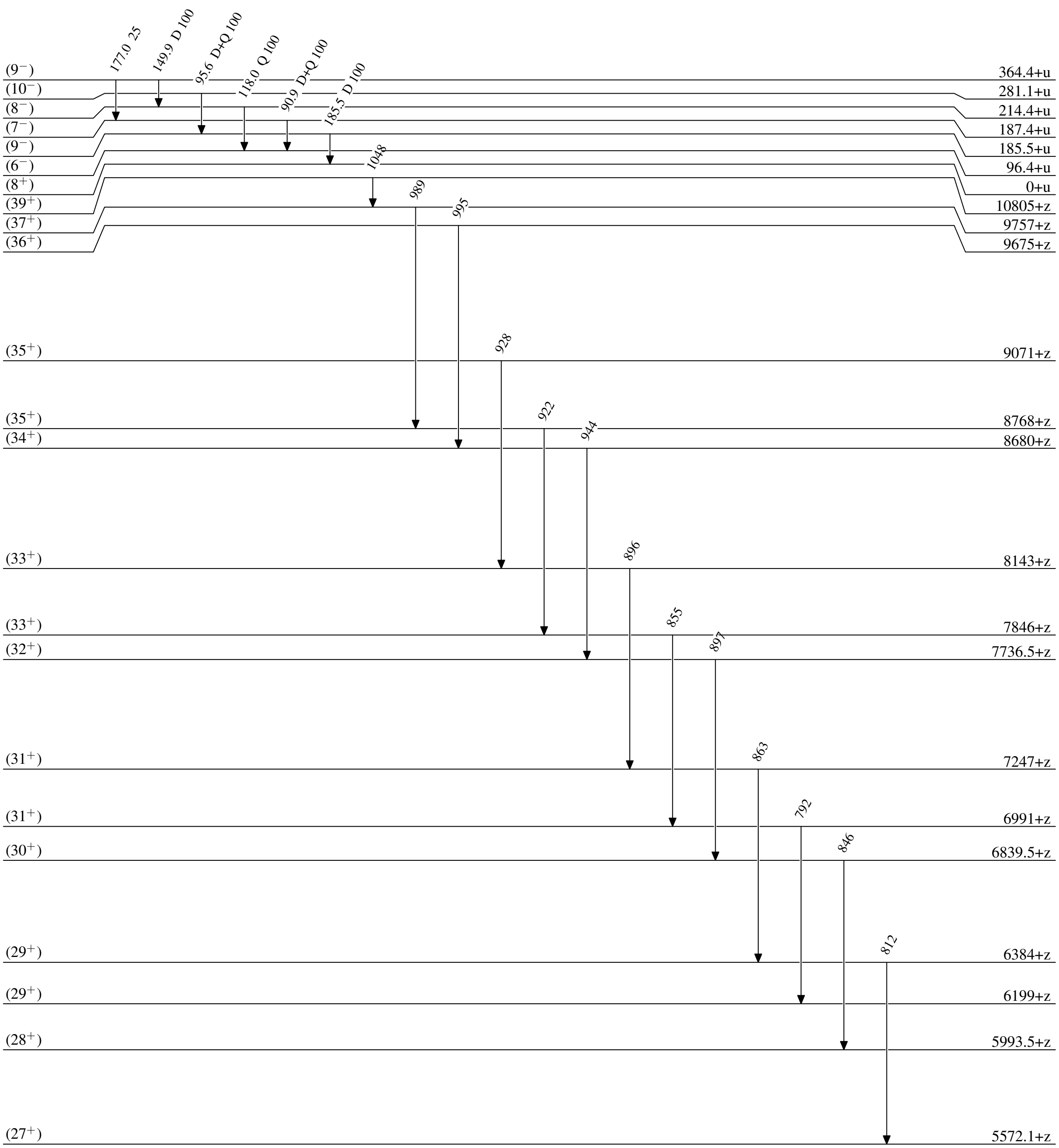


$^{172}_{75}Re_{97}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

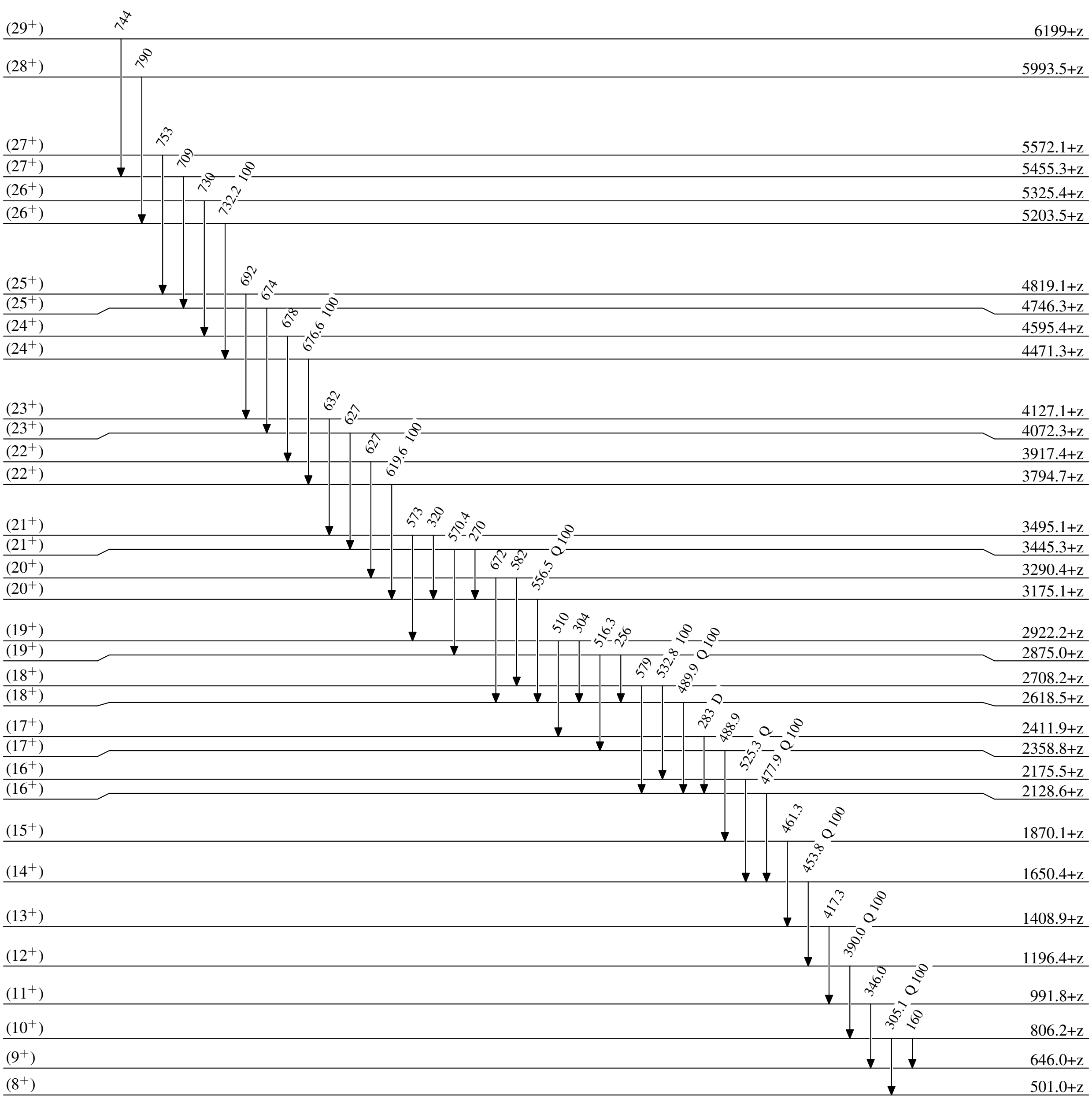


$^{172}_{75}Re_{97}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{172}_{75}Re_{97}$

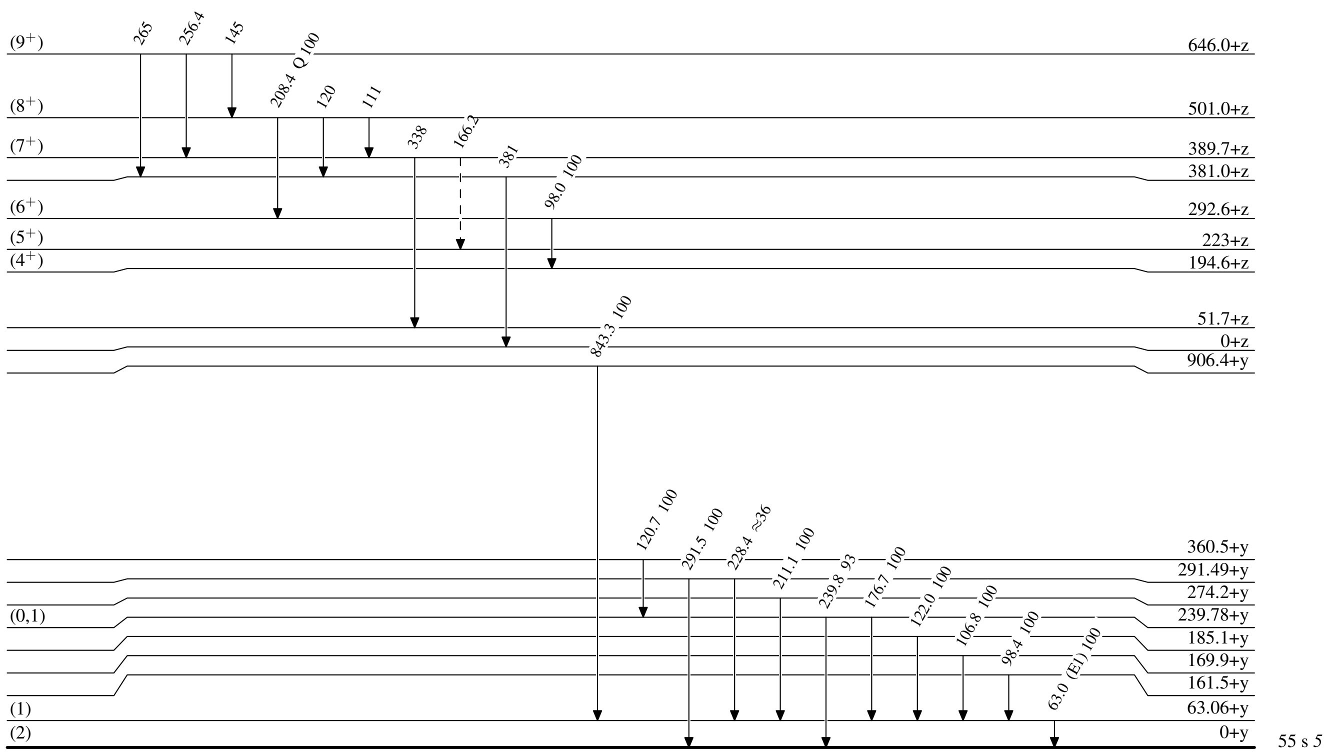
Adopted Levels, Gammas

Legend

Level Scheme (continued)

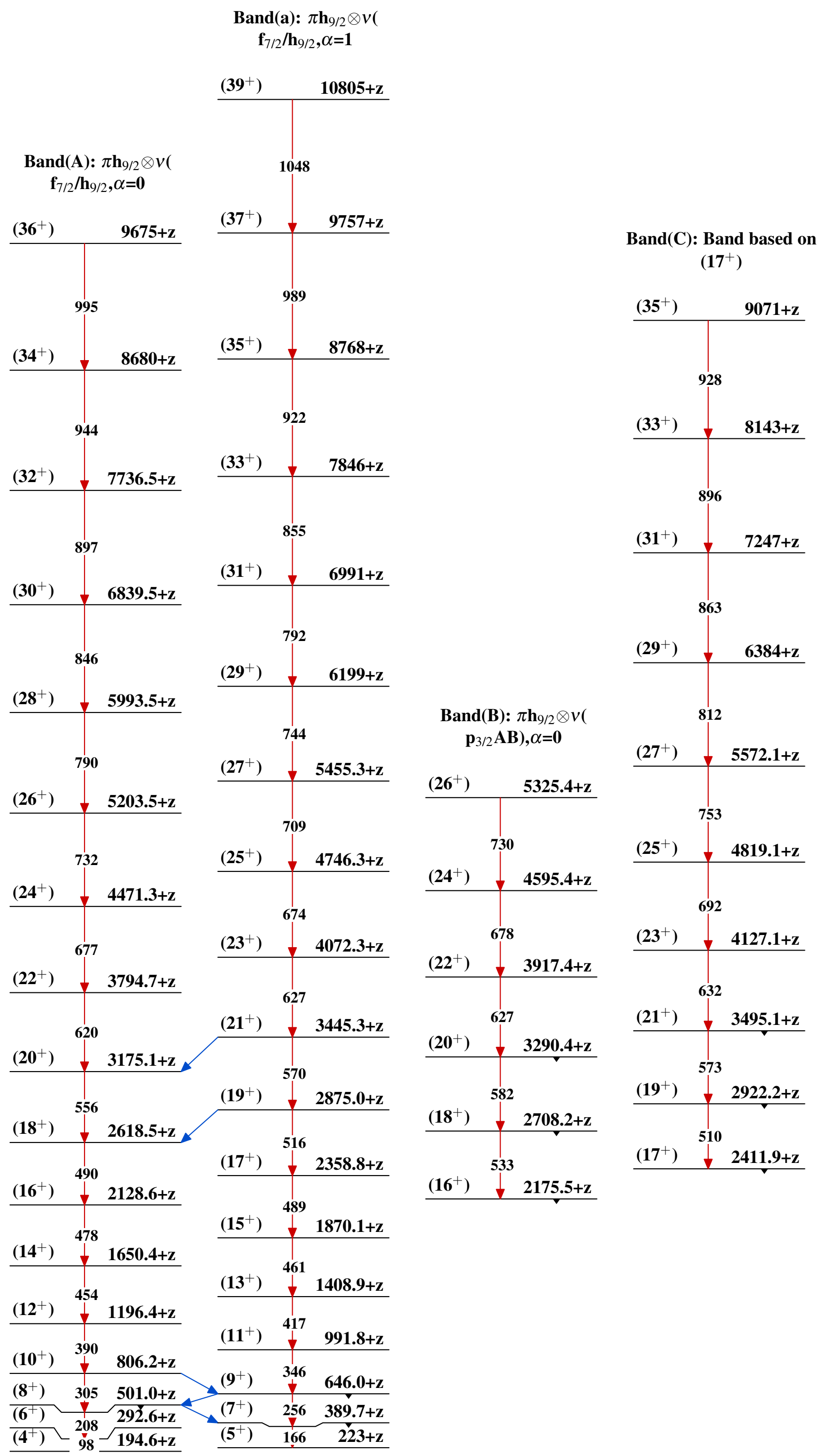
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



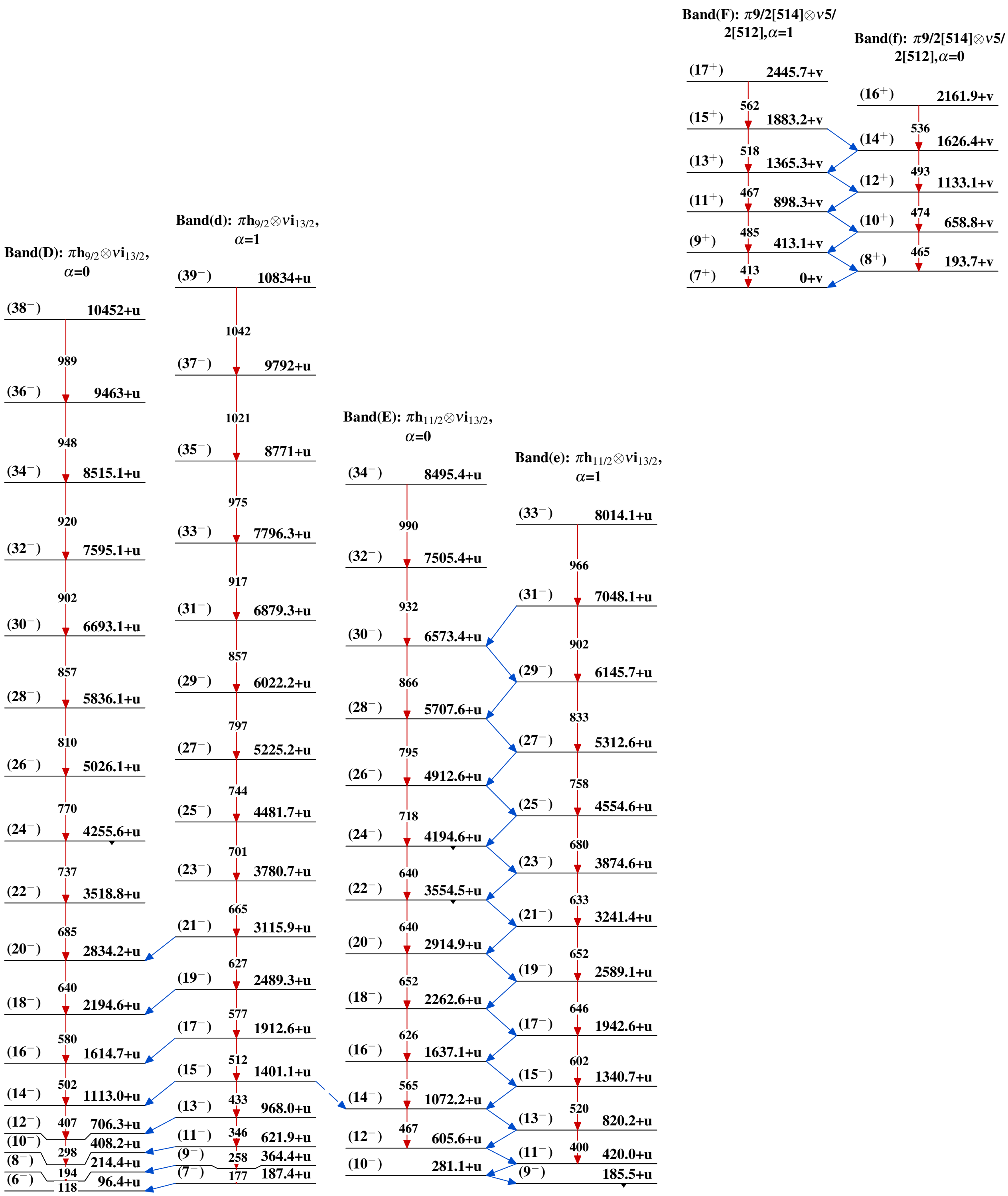
$^{172}_{75}Re_{97}$

Adopted Levels, Gammas



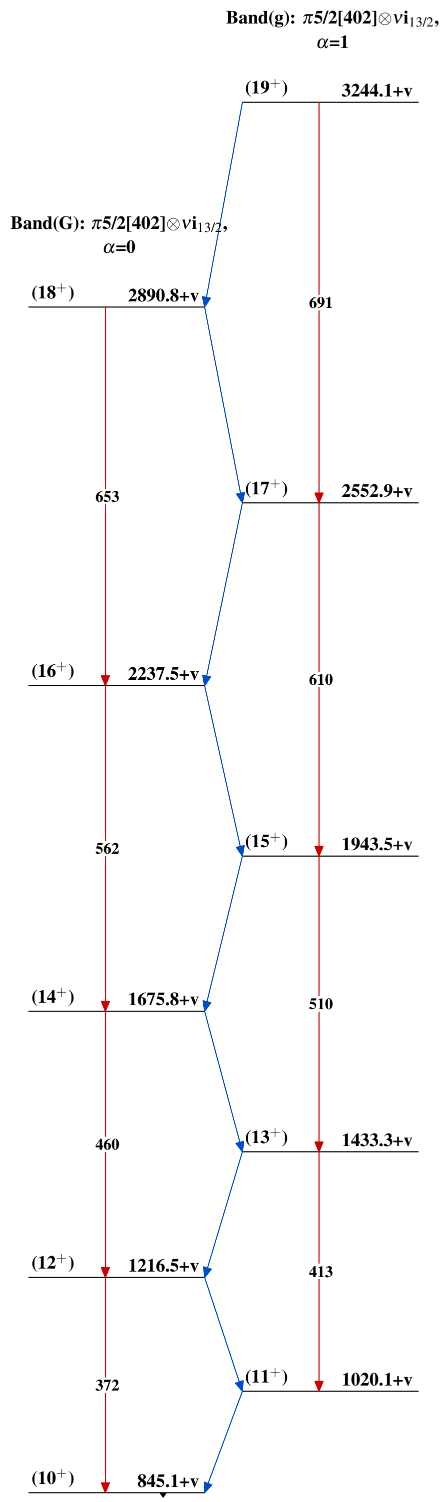
$^{172}_{75}Re_{97}$

Adopted Levels, Gammas (continued)



$^{172}_{75}Re_{97}$

Adopted Levels, Gammas (continued)



$^{172}_{75}Re_{97}$