^{156}Gd(^{36}S,4nγ) 1993BeZJ

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev, S. Juutinen, D. J. Hartley	NDS 150, 1 (2018)	1-Feb-2018

1993BeZJ (also 1992BeZV): E=167 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$ (DCO) using an array of 12 Compton-suppressed Ge detectors surrounded by a 50 element BGO ball. Total Routhian surface (TRS) and cranked shell-model calculations.

^{188}Hg Levels

E(level)[†]	J$^\pi$[‡]	Comments
0.0[#]	0$^+$	
412.80[#] *24*	2$^+$	
825.2[e] *11*	0$^+$	E(level),J$^\pi$: from Adopted Levels.
881.20[e] *24*	2$^+$	
1004.9[#] *4*	4$^+$	
1208.1[e] *3*	4$^+$	
1509.2[e] *4*	6$^+$	
1777.2[#] *4*	6$^+$	
1909.7[b] *4*	5$^-$	
1969.8[e] *4*	8$^+$	
2201.3[b] *4*	7$^-$	
2295.2[c] *5*	6$^-$	
2422.7[#] *4*	8$^+$	
2448.6[c] *5*	8$^-$	
2470.6[b] *5*	9$^-$	
2490.8[e] *5*	10$^+$	
2662.4[#] *5*	10$^+$	
2724.0[@] *6*	12$^+$	
2783.9[c] *5*	10$^-$	
2947.0 *5*	10$^+$	
2967.7[d] *5*	11$^-$	
3011.2[b] *5*	11$^-$	
3069.4[e] *6*	12$^+$	
3113.7 *6*	12$^+$	
3161.4[@] *6*	14$^+$	
3219.2[f] *5*	11$^-$	
3249.7[c] *6*	12$^-$	
3446.9[d] *6*	13$^-$	
3681.8[b] *6*	13$^-$	
3687.9[f] *6*	13$^-$	
3689.5[e] *6*	14$^+$	
3804.4 *6*	14$^+$	
3821.2[@] *6*	16$^+$	
3931.4[c] *7*	14$^-$	
4126.5[d] *6*	15$^-$	
4160.3[f] *7*	15$^-$	
4255.7 *7*	16$^+$	
4256.7[b] *6*	15$^-$	
4329.6[e] *7*	16$^+$	
4502.8[a] *7*	16	

Continued on next page (footnotes at end of table)

^{156}Gd(^{36}S,4nγ) 1993BeZJ (continued)

^{188}Hg Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
4554.0[b] 6	17−	5306.2[&] 7	20+	5742.6[f] 9	21−	6831.4[@] 8	24+
4581.7[@] 7	18+	5397.3[a] 8	20	5916.7[&] 8	22+	6952.8[b] 8	25−
4628.3[f] 7	17−	5468.9[@] 7	20+	6161.8[b] 7	23−	7139.0[f] 10	25−
4840.9[d] 7	17−	5582.5 7	21−	6242.9[@] 8	22+	7314.7?[&] 15	26+
4850.4[a] 8	18	5601.9[d] 7	19−	6386.1 8	23−	7852.6[b] 8	27−
4949.7[b] 7	19−	5605.1[b] 7	21−	6405.8[f] 9	23−	7941.2[f] 10	27−
4988.6[e] 8	18+	5684.3[e] 8	20+	6408.1[e] 9	22+		
5150.6[f] 8	19−	5706.6 8	20+	6717.7[&] 9	24+		

† From a least-squares fit to Eγ.
‡ From 1993BeZJ, based on the deduced transition multipolarities and the observed band structures, unless otherwise stated.
# Band(A): g.s. band.
@ Band(B): band 2 (α=0).
& Band(C): band 3 (α=0).
a Band(D): band 4 (α=0).
b Band(E): band 5 (α=1).
c Band(F): band 6 (α=0).
d Band(G): band 7 (α=1).
e Band(H): band 8 (α=0). Kπ=0+ (prolate) band.
f Band(I): band 9 (α=1).

γ(^{188}Hg)

Eγ†	Iγ†	Ei(level)	Jiπ	Ef	Jfπ	Mult.‡	Comments
(56.0)		881.20	2+	825.2	0+		Eγ: From level energy difference.
61.6 7		2724.0	12+	2662.4	10+		Eγ: from level energy difference.
153.4 3	0.50 14	2448.6	8−	2295.2	6−		Mult.: DCO=0.5 3 suggests ΔJ=1, dipole. But 1993BeZJ assign ΔJ=2.
171.6 3	1.6 4	2662.4	10+	2490.8	10+	(E2+M1)	Mult.: DCO=1.5 3; ΔJ=0 transition.
183.8 3	5.8 5	2967.7	11−	2783.9	10−	(E2+M1)	Mult.: DCO=1.27 12, but the value requires significant E2 component.
197.2[#] 3	0.70 15	3446.9	13−	3249.7	12−		Mult.: DCO=0.9 3 gives ΔJ=2 or ΔJ=1. 1993BeZJ assign ΔJ=1.
239.7 3	0.7 2	2662.4	10+	2422.7	8+		
247.3 3	1.9 6	2448.6	8−	2201.3	7−		
269.3 3	36.1 4	2470.6	9−	2201.3	7−	E2	Mult.: DCO=1.32 9.
272.2 3	12.1 4	3219.2	11−	2947.0	10+	(E1)	Mult.: DCO=0.80 10.
291.6 3	12.1 3	2201.3	7−	1909.7	5−	E2	Mult.: DCO=1.06 15.
297.3 3	15.6 4	4554.0	17−	4256.7	15−	E2	Mult.: DCO=1.29 20.
301.1 3	8.0 7	1509.2	6+	1208.1	4+	E2	Mult.: DCO=1.86 20.
305.3[#] 3	0.5 2	2967.7	11−	2662.4	10+		
313.3 3	14.8 4	2783.9	10−	2470.6	9−	(E2+M1)	Mult.: DCO=1.44 11, but the value requires significant E2 component.
326.9 3	5.2 8	1208.1	4+	881.20	2+	E2	Mult.: DCO=1.30 17.
335.3 3	2.1 2	2783.9	10−	2448.6	8−		
347.6 3	3.6 6	4850.4	18	4502.8	16	E2	Mult.: DCO=1.39 13.
385.5 3	1.5 3	2295.2	6−	1909.7	5−		
395.7 3	13.6 4	4949.7	19−	4554.0	17−	E2	Mult.: DCO=1.19 14.

Continued on next page (footnotes at end of table)

^{156}Gd(^{36}S,4nγ) 1993BeZJ (continued)

$\gamma(^{188}Hg)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
412.8 *3*	100	412.80	2^+	0.0	0^+	E2	Mult.: DCO=1.04 *3*.
424.1 *3*	16.8 *5*	2201.3	7^-	1777.2	6^+	(E1)	Mult.: DCO=0.78 *15*.
427.5 *3*	5.3 *4*	4554.0	17^-	4126.5	15^-	E2	Mult.: DCO=1.23 *17*.
437.4 *3*	30.7 *21*	3161.4	14^+	2724.0	12^+	E2	Mult.: DCO=1.20 *7*.
451.3 *3*	6.1 *6*	3113.7	12^+	2662.4	10^+		
451.3 *3*	2.8 *6*	4255.7	16^+	3804.4	14^+		
456.2 *3*	6.6 *4*	2947.0	10^+	2490.8	10^+	(E2+M1)	Mult.: DCO=1.25 *8*; ΔJ=0 transition.
460.6 *3*	47.4 *7*	1969.8	8^+	1509.2	6^+	E2	Mult.: DCO=1.35 *5*.
465.8 *3*	6.0 *10*	3249.7	12^-	2783.9	10^-	E2	Mult.: DCO=1.41 *11*.
468.0 *3*	11.4 *11*	4628.3	17^-	4160.3	15^-		
468.4 *3*	2.4 *3*	881.20	2^+	412.80	2^+		Mult.: DCO=1.30 *15*.
468.7 *3*	14.3 *11*	3687.9	13^-	3219.2	11^-	E2	Mult.: DCO=1.27 *9*.
472.4 *3*	12.7 *11*	4160.3	15^-	3687.9	13^-	E2	Mult.: DCO=1.32 *12*.
479.2 *3*	12.0 *10*	3446.9	13^-	2967.7	11^-	E2	Mult.: DCO=1.30 *10*.
504.3 *3*	53.4 *6*	1509.2	6^+	1004.9	4^+	E2	Mult.: DCO=1.22 *6*.
521.0 *3*	44.7 *10*	2490.8	10^+	1969.8	8^+	E2	Mult.: DCO=1.42 *6*.
522.3 *3*	6.9 *7*	5150.6	19^-	4628.3	17^-	E2	Mult.: DCO=1.36 *23*.
524.3 *3*	7.2 *5*	2947.0	10^+	2422.7	8^+	E2	Mult.: DCO=1.44 *25*.
540.6 *3*	20.9 *5*	3011.2	11^-	2470.6	9^-	E2	Mult.: DCO=1.47 *11*.
546.9 *3*	2.4 *6*	5397.3	20	4850.4	18	E2	Mult.: DCO=1.34 *19*.
556.7 *3*	2.1 *4*	6161.8	23^-	5605.1	21^-		
569.1 *3*	7.9 *8*	1777.2	6^+	1208.1	4^+	E2	Mult.: DCO=1.3 *3*.
574.9 *3*	15.5 *5*	4256.7	15^-	3681.8	13^-	E2	Mult.: DCO=1.46 *12*.
578.6 *3*	26.2 *6*	3069.4	12^+	2490.8	10^+	E2	Mult.: DCO=1.23 *10*.
579.3 *3*	0.9 *3*	6161.8	23^-	5582.5	21^-		
588.5 *3*	1.3 *6*	6831.4	24^+	6242.9	22^+		
592.0 *3*	5.5 *10*	5742.6	21^-	5150.6	19^-		
592.1 *3*	91.9 *10*	1004.9	4^+	412.80	2^+	E2	Mult.: DCO=1.15 *3*.
597[#]		7314.7?	26^+	6717.7	24^+		
610.5 *3*	3.6 *4*	5916.7	22^+	5306.2	20^+	E2	Mult.: DCO=1.47 *25*.
620.1 *3*	19.1 *5*	3689.5	14^+	3069.4	12^+	E2	Mult.: DCO=1.43 *9*.
632.8 *3*	4.3 *4*	5582.5	21^-	4949.7	19^-	E2	Mult.: DCO=1.43 *16*.
640.1 *3*	12.8 *5*	4329.6	16^+	3689.5	14^+	E2	Mult.: DCO=1.42 *11*.
645.5 *3*	13.6 *7*	2422.7	8^+	1777.2	6^+	E2	Mult.: DCO=1.21 *17*.
655.4 *3*	4.5 *4*	5605.1	21^-	4949.7	19^-	E2	Mult.: DCO=1.25 *21*.
659.0 *3*	10.8 *5*	4988.6	18^+	4329.6	16^+	E2	Mult.: DCO=1.29 *17*.
659.8 *3*	23.8 *5*	3821.2	16^+	3161.4	14^+	E2	Mult.: DCO=1.43 *8*.
663.2 *3*	4.0 *4*	6405.8	23^-	5742.6	21^-	E2	Mult.: DCO=1.7 *4*.
670.6 *3*	16.3 *5*	3681.8	13^-	3011.2	11^-	E2	Mult.: DCO=1.56 *12*.
679.6 *3*	10.0 *6*	4126.5	15^-	3446.9	13^-	E2	Mult.: DCO=1.4 *3*.
681.6 *3*	3.8 *6*	4502.8	16	3821.2	16^+		Mult.: DCO=1.20 *13*; Dipole (M1 or E1) transition.
681.7 *3*	4.0 *10*	3931.4	14^-	3249.7	12^-		
690.7 *3*	5.0 *6*	3804.4	14^+	3113.7	12^+		
692.1 *3*	6.5 *13*	2201.3	7^-	1509.2	6^+	(E1)	Mult.: DCO=0.78 *12*.
692.6 *3*	3.9 *6*	2662.4	10^+	1969.8	8^+		
695.7 *3*	5.6 *5*	5684.3	20^+	4988.6	18^+		
714.4 *3*	1.3 *3*	4840.9	17^-	4126.5	15^-		
718.0 *3*		5706.6	20^+	4988.6	18^+		E_γ: from fig 6.1 (1993BeZJ).
723.8 *3*	2.7 *5*	6408.1	22^+	5684.3	20^+	E2	Mult.: DCO=1.6 *3*.
724.5 *3*	7.0 *4*	5306.2	20^+	4581.7	18^+	E2	Mult.: DCO=1.52 *11*.
728.4 *3*	1.0 *3*	3219.2	11^-	2490.8	10^+	(E1)	Mult.: DCO=0.8 *3*.
732.8 *3*	4.6 *4*	4554.0	17^-	3821.2	16^+	(E1)	Mult.: DCO=0.84 *14*.
733.2 *3*	2.1 *4*	7139.0	25^-	6405.8	23^-	E2	Mult.: DCO=1.26 *14*.
760.5 *3*	12.9 *5*	4581.7	18^+	3821.2	16^+	E2	Mult.: DCO=1.60 *10*.
761.0 *3*	1.5 *3*	5601.9	19^-	4840.9	17^-		

Continued on next page (footnotes at end of table)

^{156}Gd(^{36}S,4nγ) 1993BeZJ (continued)

$\gamma(^{188}Hg)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
772.3 *3*	18.8 *5*	1777.2	6^+	1004.9	4^+	E2	Mult.: DCO=1.34 *12*.
774.0 *3*	0.9 *3*	6242.9	22^+	5468.9	20^+		
791.0 *3*	2.3 *5*	6952.8	25^-	6161.8	23^-		
795.3 *3*	5.7 *4*	1208.1	4^+	412.80	2^+	E2	Mult.: DCO=1.3 *3*.
801.0 *3*	1.0 *4*	6717.7	24^+	5916.7	22^+		
802.2 *3*	0.9 *2*	7941.2	27^-	7139.0	25^-	E2	Mult.: DCO=1.2 *3*.
803.6 *3*	2.8 *4*	6386.1	23^-	5582.5	21^-		
809.8 *3*	2.1 *4*	4256.7	15^-	3446.9	13^-		
881.2 *3*	2.8 *5*	881.20	2^+	0.0	0^+		
887.2 *3*	2.5 *5*	5468.9	20^+	4581.7	18^+	E2	Mult.: DCO=1.32 *25*.
899.8 *3*	1.5 *4*	7852.6	27^-	6952.8	25^-		
904.8 *3*	11.0 *22*	1909.7	5^-	1004.9	4^+	(E1)	Mult.: DCO=0.76 *12*.
936.7 *3*	1.2 *6*	6242.9	22^+	5306.2	20^+	E2	Mult.: DCO=1.4 *3*.

[†] From 1993BeZJ.
[‡] From DCO ratios and observed band structures in 1993BeZJ. Since the DCO ratios cannot distinguish between E1 and M1 multipolarities, such transitions are given in parenthesis.
[#] Placement of transition in the level scheme is uncertain.

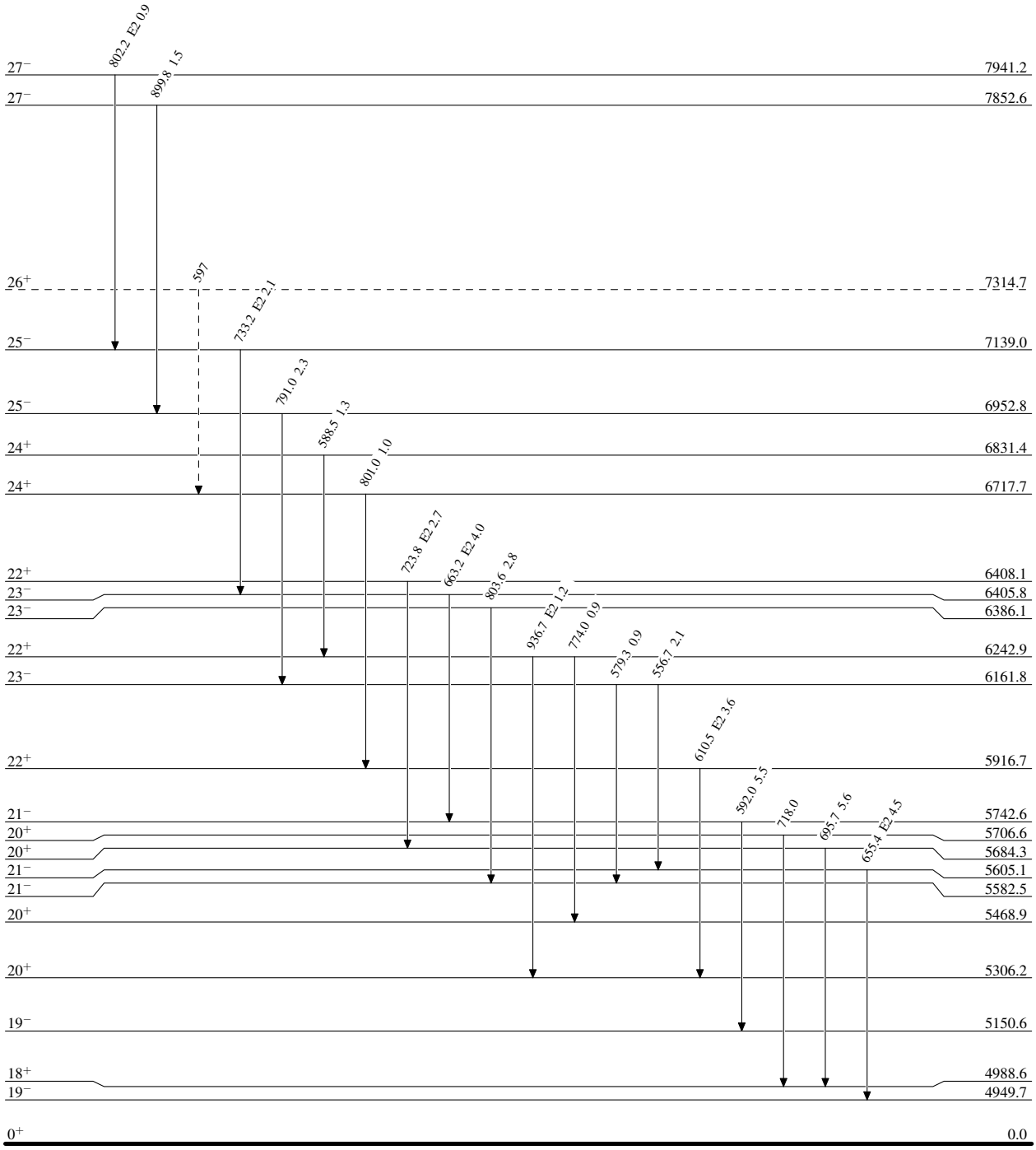
^{156}Gd(^{36}S,4nγ) 1993BeZJ

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)



$^{188}_{80}Hg_{108}$

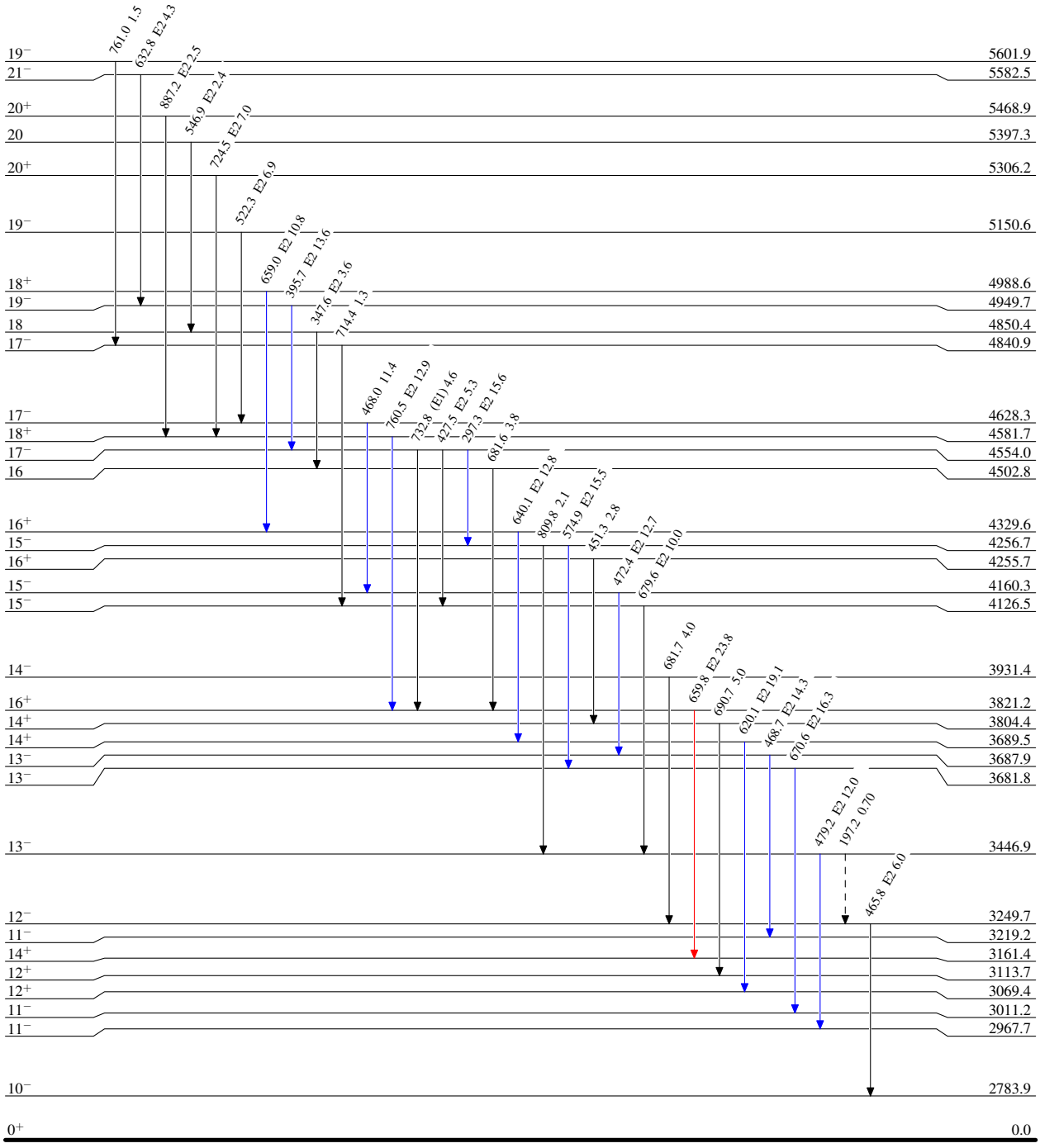
^{156}Gd(^{36}S,4nγ) 1993BeZJ

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)



$^{188}_{80}Hg_{108}$

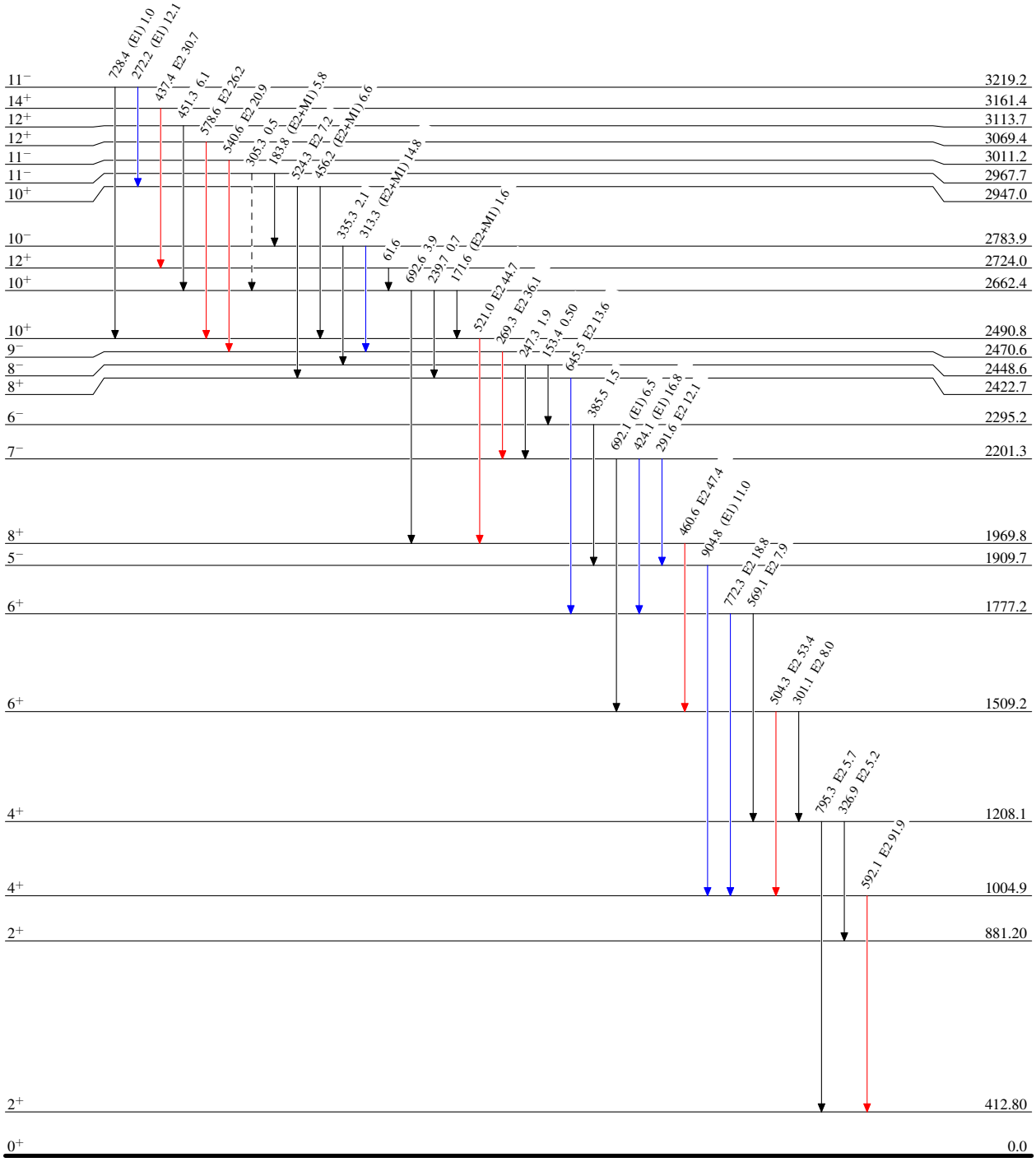
^{156}Gd(^{36}S,4nγ) 1993BeZJ

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)



$^{188}_{80}Hg_{108}$

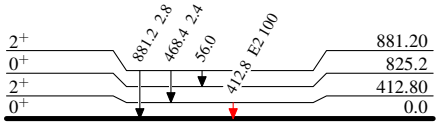
^{156}Gd(^{36}S,4nγ) 1993BeZJ

Level Scheme (continued)

Intensities: Relative I_γ

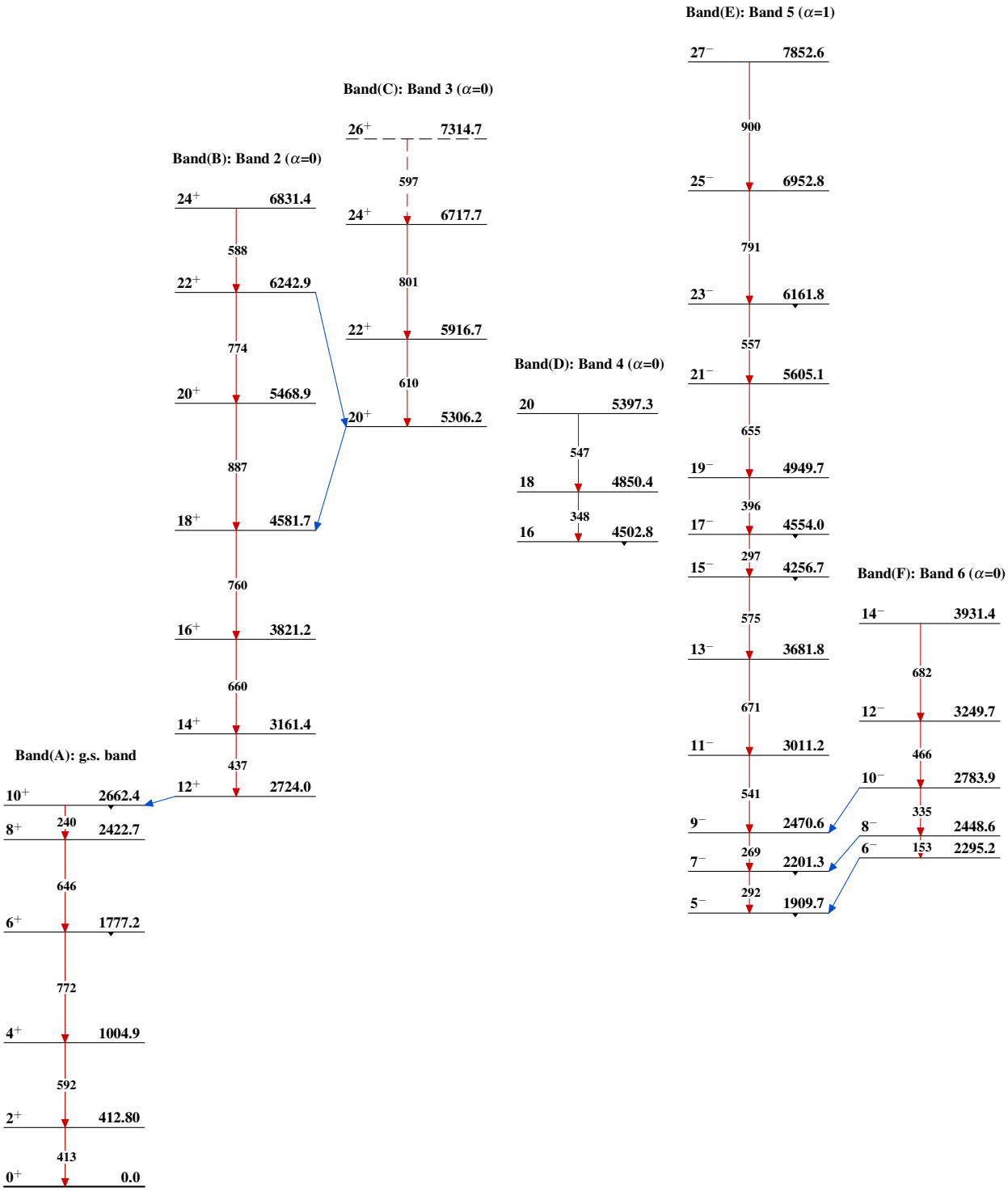
Legend

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



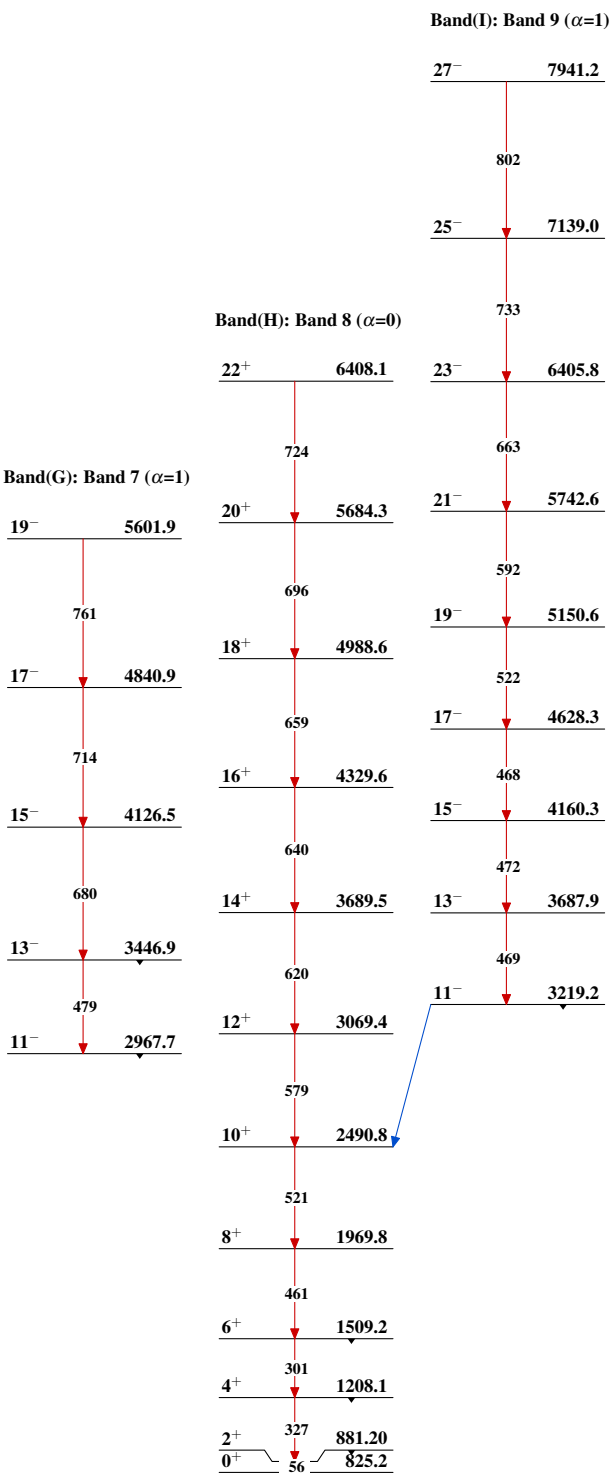
$^{188}_{80}Hg_{108}$

$^{156}Gd(^{36}S,4n\gamma)$ 1993BeZJ



$^{188}_{80}Hg_{108}$

^{156}Gd(^{36}S,4nγ) 1993BeZJ (continued)



$^{188}_{80}Hg_{108}$