^{160}Gd(α,2nγ) 2006Ap01,1982Fi15

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 195,1 (2024)	19-Sep-2023

Additional information 1.

Data are primarily from 2006Ap01, which are more extensive than those of 1982Fi15. Where these two studies differ, this is noted. Other (α,2nγ) studies include those of 1963Mo14, 1972Ew02, 1981Wa22.

Related studies include: 1985Ra07 and 1986Re18 (^{163}Dy(d,tγ)); and 1986Bo27 (^{159}Tb(α,pγ)).

2006Ap01: Eα=20 MeV. Self-supporting target, 10 mg/cm^2 thick, 98% enriched in ^{160}Gd. Measured Eγ, Iγ, γγ, γγ(θ)(DCO) using the HERA array of 21 Compton-suppressed Ge detectors.

1982Fi15: Eα=24 and 28 MeV. Enriched (≥98% ^{160}Gd) target. Measured γ singles, γγ coin, and γγ(θ) using Ge detectors and ce using Si(Li) detector and mini-orange spectrometer.

1997Al04: (α,2nγ) reactions on a metallic target of natural Gd. E(α)=27 MeV. Measured precession of the directional correlations of the 8+→6+→4+→2$^+$ cascade in the g.s. band, with the target in a strong external magnetic field parallel to the beam direction. γ radiation detected in a ring of 12 Ge detectors mounted perpendicular to the beam direction. Deduced g factors for the 4$^+$, 6$^+$, and 8$^+$ members of the g.s. band.

^{162}Dy Levels

1982Fi15 propose the existence of a K^π=(6$^-$) band with the levels: 6$^-$ (1807); 8$^-$ (1949); 9$^-$ (2189); 10$^-$ (2320); 11$^-$ (2512); 12$^-$ (2671); and 14$^-$ (3132). The existence of this band has not been established by 2006Ap01 and in other studies, as well. The evaluator has not adopted it.

1982Fi15 report population of the 1$^-$ and 3$^-$ members of the K^π=0$^-$ octupole band in their study. This is based primarily on the existence of a (doubly placed) 1277 γ. These placements are not confirmed by 2006Ap01. Although these two levels are well established in other studies and the 3$^-$ level here, too, the evaluator has assumed that the 1$^-$ level is not observably populated in (α,2nγ).

Other levels reported by 1982Fi15 but not confirmed in (α,2nγ) by 2006Ap01 include: 1453.0, 2$^+$; 1807.4, (6$^-$); 1949.84, (8$^-$); 2189.0, (9$^-$); 2320.4, (10$^-$); 2512.8, (11$^-$); and 3132.3, (14$^-$). Note that these latter, negative-parity levels are all members of the proposed K^π=6$^-$ band, whose existence (at least at the listed energies) has not been confirmed. Note, also, that the data from 1982Fi15 do not extend to levels above 3138.8 keV.

E(level)[†]	J$^\pi$[#]	Comments
0.0[@]	0$^+$	
80.75[@] *8*	2$^+$	
265.79[@] *10*	4$^+$	g=+0.28 *3* g: From 1997Al04, who report g=+0.285 *31*.
548.67[@] *11*	6$^+$	g=+0.28 *3* g: g factor as reported by 1997Al04 is +0.301 *31*, computed assuming $T_{1/2}$=17.4 ps *5* (quoted by 1997Al04). The listed value has been corrected to take into account the different $T_{1/2}$ value (18.4 ps *10*, from Adopted Levels, Gammas) used in this evaluation. Note, however, that this μ value has not been adopted.
888.25[&] *8*	2$^+$	
921.20[@] *12*	8$^+$	g=+0.45 *12* g: g factor as reported by 1997Al04 is +0.43 *12*, computed assuming $T_{1/2}$=4.39 ps *12* (quoted by 1997Al04). The listed value has been corrected to take into account the different $T_{1/2}$ value (4.2 ps *2*, from Adopted Levels, Gammas) used in this evaluation. Note, however, that this μ value has not been adopted.
963.02[&] *10*	3$^+$	
1061.20[&] *10*	4$^+$	
1148.35[a] *13*	2$^-$	
1182.97[&] *10*	5$^+$	

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^{160}Gd(α,2nγ) 2006Ap01,1982Fi15 (continued)

^{162}Dy Levels (continued)

E(level)[†]	J$^{\pi}$[#]	Comments
1210.26[a] *14*	3$^-$	
1297.18[a] *12*	4$^-$	
1324.69[&] *11*	6$^+$	
1357.69[b] *23*	3$^-$	
1375.04[@] *13*	10$^+$	
1391.13[a] *13*	5$^-$	
1485.92[d] *12*	5$^-$	
1490.43[&] *11*	7$^+$	
1518.68[b] *20*	5$^-$	
1530.32[a] *12*	6$^-$	
1535.82[e] *10*	4$^+$	
1574.2[c] *4*	4$^+$	
1575.94[d] *12*	6$^-$	
1634.63[e] *11*	5$^+$	
1637.46[a] *14*	7$^-$	
1670.42[&] *12*	8$^+$	
1683.56[d] *13*	7$^-$	
1691.42[‡] *23*	2$^-$	E(level): possible member of the K^{π}=1$^-$ band.
1745.8[‡f] *4*	1$^+$	
1752.12[e] *10*	6$^+$	
1755.7[b] *5*	(7)$^-$	J$^{\pi}$: 2006Ap01 list (7$^-$).
1767.36[c] *20*	6$^+$	
1782.42[‡f] *23*	2$^+$	
1807.70[d] *12*	8$^-$	
1845.86[a] *13*	8$^-$	
1878.03[&] *12*	9$^+$	
1887.88[e] *11*	7$^+$	
1901.48[@] *14*	12$^+$	
1939.56[d] *14*	9$^-$	
1959.00[a] *15*	9$^-$	
1985.63[c] *17*	8$^+$	
2041.17[‡e] *12*	8$^+$	
2087.67[&] *13*	10$^+$	
2100.67[b] *18*	9$^-$	
2110.91[d] *14*	10$^-$	
2157.5?[‡] *4*		
2187.88 *14*	(9$^-$)	E(level): consistent with that proposed as the 9$^-$ member of a K^{π}=6$^-$ band. But the existence of this band at the previously proposed location has not been confirmed. The two decaying γ's are relocated by 2011Sw02 (^{160}Gd(^{9}Be,α3nγ)) at (9$^-$), 2188 isomeric level.
2211.83[‡e] *13*	9$^+$	
2234.43[a] *14*	10$^-$	
2262.39[c] *15*	10$^+$	
2281.02[d] *16*	11$^-$	
2332.01[a] *16*	11$^-$	
2337.30[&] *14*	11$^+$	
2398.41[‡e] *19*	10$^+$	
2483.22[d] *19*	12$^-$	

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^{160}Gd(α,2nγ) 2006Ap01,1982Fi15 (continued)

^{162}Dy Levels (continued)

E(level)[†]	Jπ[#]	Comments
2492.41[@] *21*	14+	
2504.15[b] *23*	11−	
2535.21[c] *15*	12+	Band assignment is that of 2001Wu05 (^{162}Dy,^{162}Dy′γ) and 2002Ju08 (^{7}Li,p4nγ). 2006Ap01 assign it as a member of the γ-vibrational band. See, also, the comment on the 2623 level.
2601.75[‡e] *16*	11+	
2623.46[‡&] *16*	12+	Band assignment is that of 2001Wu05 (^{162}Dy,^{162}Dy′γ) and 2002Ju08 (^{7}Li,p4nγ). 2006Ap01 assign it as a member of the S band. See, also, the comment on the 2535 level. Jπ: 2006Ap01 show this value in parentheses.
2625.29[‡] *18*		Level reported only by 2006Ap01. It is not included in the Adopted Levels.
2671.01[a] *16*	12−	Jπ: 2006Ap01 show this value in parentheses.
2683.10[d] *19*	13−	
2778.58[a] *18*	13−	Jπ: 2006Ap01 show this value in parentheses.
2859.66[&] *21*	13+	
2935.33[‡c] *19*	14+	Jπ: assignment is that of the evaluator and is based on data from (^{7}Li,p4nγ). 2006Ap01 assign this tentatively as the 13− member of the K^{π}=0− octupole band, but in (^{7}Li,p4nγ) this band member is placed at 2693.7 keV.
2964.16[‡b] *22*	13−	Jπ: J^{π} and band assignment is that of the evaluator and is based on data from (^{7}Li,p4nγ). 2006Ap01 report this level but show its J^{π} value as questionable.
3139.6[@] *3*	16+	
3146.06[&] *21*	14+	Jπ: 2006Ap01 enclose this value in parentheses.
3146.8?[d] *3*	15−	Jπ: J^{π} and band assignment is that of the evaluator and is based on data from (^{7}Li,p4nγ). 2006Ap01 report this level but show its J^{π} value as questionable.
3294.3?[a] *3*	15−	Jπ: J^{π} and band assignment is that of the evaluator and is based on data from (^{7}Li,p4nγ). 2006Ap01 report this level but show its J^{π} value as questionable.
3832.3[@] *4*	18+	

[†] From a least-squares fit to the listed Eγ values.
[‡] Level and deexciting γ′s not reported by 1982Fi15.
[#] From the Adopted Values. Where these differ from those of 2006Ap01, this is noted.
[@] Band(A): Kπ=0+, g.s. band.
[&] Band(B): Kπ=2+, γ-vibrational band.
[a] Band(C): Kπ=2− octupole-vibrational band.
[b] Band(D): Kπ=0− octupole-vibrational band.
[c] Band(E): first excited Kπ=0+ band. S, or Super, band.
[d] Band(F): Kπ=5− band.
[e] Band(G): Kπ=4+ band.
[f] Band(H): Kπ=1+ band.

γ(^{162}Dy)

1982Fi15 list α(K)exp values for a number of their observed γ′s but do not list mults.

E_{γ}[†]	I_{γ}[†]	E_i(level)	J^{π}_i	E_f	J^{π}_f	Mult.[#]	Comments
80.8 *1*	19 *1*	80.75	2+	0.0	0+		DCO=1.20 *7*
90.1 *2*	2.3 *2*	1575.94	6−	1485.92	5−		DCO=2.8 *4*
98.8 *2*	0.3	1634.63	5+	1535.82	4+	M1+E2	Mult.: 2006Ap01 report %E2=20 *2*.
107.7 *2*	‡	1683.56	7−	1575.94	6−		

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^{160}Gd(α,2nγ) 2006Ap01,1982Fi15 (continued)

γ(^{162}Dy) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	Comments
114.4 2	‡	1297.18	4⁻	1182.97	5⁺		
117.5 1	1.4 2	1752.12	6⁺	1634.63	5⁺	E2+M1	DCO=3.5 8 Mult.: 2006Ap01 report %M1<16.
124.1 1	2.9 3	1807.70	8⁻	1683.56	7⁻		DCO=6.0 7
135.9 1	1.3 1	1887.88	7⁺	1752.12	6⁺	E2+M1	DCO=4.1 7
149.1 3	‡	1210.26	3⁻	1061.20	4⁺		
151.7 2	1.4 2	2110.91	10⁻	1959.00	9⁻		DCO=3.5 6
153.4 1	1.3 4	2041.17	8⁺	1887.88	7⁺	E2+M1	DCO=3.0 5
170.7 2	1.7 2	2211.83	9⁺	2041.17	8⁺	E2+M1	DCO=4.0 8
171.3 1	4.0 4	2110.91	10⁻	1939.56	9⁻		DCO=0.30 7 DCO is for ΔJ=1, dipole gated.
173.1 3	0.8 2	1061.20	4⁺	888.25	2⁺	E2	DCO=1.0 4
185.0 1	100 4	265.79	4⁺	80.75	2⁺		DCO=0.99 4
186.6@	‡	2398.41	10⁺	2211.83	9⁺		
197.4 2	0.2	1683.56	7⁻	1485.92	5⁻		
202.2 1	1.1 1	2483.22	12⁻	2281.02	11⁻		DCO=2.6 8
203.4 2	1.8 2	2601.75	11⁺	2398.41	10⁺		DCO=3.2 1 γ not reported in the heavy-ion studies.
216.3 1	1.5 2	1752.12	6⁺	1535.82	4⁺	E2	DCO=1.14 14
220.1 1	0.4 1	1182.97	5⁺	963.02	3⁺	E2	
231.6 1	3.6 4	1807.70	8⁻	1575.94	6⁻		DCO=1.00 7
233.1 2	0.9 1	1530.32	6⁻	1297.18	4⁻		DCO=1.15 13
236.0 2	0.3	1297.18	4⁻	1061.20	4⁺		
247.1 3	0.3	1210.26	3⁻	963.02	3⁺		
253.2 1	1.6 1	1887.88	7⁺	1634.63	5⁺	E2	DCO=1.01 12
260.1 1	2.7 2	1148.35	2⁻	888.25	2⁺		DCO=0.99 9
263.5 2	0.5 1	1324.69	6⁺	1061.20	4⁺	E2+M1	DCO=0.86 13 Mult.: 2006Ap01 report %E2=96.7, but placement requires pure E2.
275.6 2	0.2	1485.92	5⁻	1210.26	3⁻		
276.8 1	‡	2262.39	10⁺	1985.63	8⁺		DCO=1.00 23
277.3 2	0.7 1	1807.70	8⁻	1530.32	6⁻		DCO=0.98 18
282.9 1	74 3	548.67	6⁺	265.79	4⁺		DCO=1.03 6
289.0 1	1.1 2	2041.17	8⁺	1752.12	6⁺	E2	DCO=0.90 15
303.3 1	2.6 3	2110.91	10⁻	1807.70	8⁻		DCO=1.00 6
307.7 2	1.7 2	1490.43	7⁺	1182.97	5⁺	E2	DCO=0.98 9
315.6 1	2.1 2	1845.86	8⁻	1530.32	6⁻		DCO=1.04 11 DCO=1.73 11 (ΔJ=1, dipole gated).
317.7 1	1.0 1	1807.70	8⁻	1490.43	7⁺		DCO=1.40 24
322.0 3	0.3	1210.26	3⁻	888.25	2⁺		
323.9 1	2.7 2	2211.83	9⁺	1887.88	7⁺	E2	DCO=0.99 18
329.4 3	0.2	1391.13	5⁻	1061.20	4⁺		
333.6 2	0.4	2671.01	12⁻	2337.30	11⁺		
333.9 2	0.8 1	2211.83	9⁺	1878.03	9⁺	E2+M1	DCO=1.52 21
334.1 1	1.3 2	1297.18	4⁻	963.02	3⁺		DCO=1.94 24
345.7 1	1.5 2	1670.42	8⁺	1324.69	6⁺	E2	DCO=1.00 13
347.4 1	5.1 5	1530.32	6⁻	1182.97	5⁺		DCO=1.74 9
355.4 1	3.5 5	1845.86	8⁻	1490.43	7⁺		DCO=1.75 13
356.4 1	1.0 1	2234.43	10⁻	1878.03	9⁺		DCO=1.75 13
357.3 2	1.7 2	2398.41	10⁺	2041.17	8⁺		DCO=0.97 10
362.9 1	‡	2625.29		2262.39	10⁺		DCO=1.1 4
372.4@	‡	2483.22	12⁻	2110.91	10⁻		
372.6 1	45 2	921.20	8⁺	548.67	6⁺		DCO=1.00 3 DCO=1.54 13, (ΔJ=1, dipole gated).

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^{160}Gd(α,2nγ) 2006Ap01,1982Fi15 (continued)

γ(^{162}Dy) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
380.3 *1*	1.5 *2*	2187.88	(9⁻)	1807.70	8⁻		DCO=0.96 *8* γ ray relocated by 2011Sw02 (^{160}Gd(^{9}Be,α3nγ)) at (9⁻), 2188 isomeric level.
387.5 *1*	2.2	1878.03	9⁺	1490.43	7⁺	E2	DCO=1.03 *10*
388.6 *1*	3.1 *3*	2234.43	10⁻	1845.86	8⁻		DCO=1.03 *10*
389.9 *1*	1.4 *1*	2601.75	11⁺	2211.83	9⁺		DCO=0.97 *10*
392.8 *1*	1.1 *1*	1575.94	6⁻	1182.97	5⁺		DCO=1.6 *3*
397.4 *3*	0.8 *1*	1887.88	7⁺	1490.43	7⁺	E2	DCO=1.3 *3*
400.0 *2*	1.3 *4*	2935.33	14⁺	2535.21	12⁺		DCO=1.17 *12*
402.2 *2*	1.0 *2*	2683.10	13⁻	2281.02	11⁻		DCO=1.8 *3* DCO is for ΔJ=1, dipole gated.
417.2 *1*	1.8 *1*	2087.67	10⁺	1670.42	8⁺		DCO=1.01 *10*
427.6 *2*	1.2 *1*	1752.12	6⁺	1324.69	6⁺	E2+M1	DCO=1.5 *3* Mult.: 2006Ap01 report %E2=63 *23*.
430.4 *2*	0.3	2332.01	11⁻	1901.48	12⁺		DCO=1.6 *4*
436.6 *1*	2.1 *3*	2671.01	12⁻	2234.43	10⁻		DCO=1.03 *13*
443.0 *2*	0.8 *2*	2935.33	14⁺	2492.41	14⁺		DCO=0.81 *18*
447.5 *1*	1.6 *1*	2535.21	12⁺	2087.67	10⁺		DCO=0.94 *8*
451.8 *2*	0.5 *1*	1634.63	5⁺	1182.97	5⁺	E2+M1	Mult.: 2006Ap01 report %M1<24.
453.8 *1*	21 *1*	1375.04	10⁺	921.20	8⁺		DCO=1.01 *3* DCO=1.74 *16*, (ΔJ=1, dipole gated).
459.2 *1*	2.4 *3*	2337.30	11⁺	1878.03	9⁺		DCO=1.03 *13*
463.6 *3*	‡	3146.06	14⁺	2683.10	13⁻		DCO=1.8 *3*
474.9 *2*	0.3	1535.82	4⁺	1061.20	4⁺	E2+M1	Mult.: 2006Ap01 report %E2=73 *8*.
502.9 *2*	0.3	1878.03	9⁺	1375.04	10⁺	E2(+M1)	DCO=1.55 *24*
504.2 *1*	3.7 *4*	2187.88	(9⁻)	1683.56	7⁻		DCO=0.99 *12* γ ray relocated by 2011Sw02 (^{160}Gd(^{9}Be,α3nγ)) at (9⁻), 2188 isomeric level.
512.5 *2*	1.3 *3*	1061.20	4⁺	548.67	6⁺	E2+M1	I_γ: this relative Iγ value is much larger than that reported in other studies, e.g., from 2006Ap01 in (n,γ), who give Iγ(512.4γ)/Iγ(795.3γ)=0.0158 *10*. The evaluator has assumed that most of the listed intensity for this γ belongs elsewhere in the level scheme. Mult.: 2006Ap01 report %E2=96.9.
522.3 *3*	1.5 *3*	2859.66	13⁺	2337.30	11⁺		DCO=0.97 *7*
526.5 *1*	7 *1*	1901.48	12⁺	1375.04	10⁺		DCO=1.0 *3*
535.7 *2*	1.0 *2*	2623.46	12⁺	2087.67	10⁺		DCO=0.99 *22*
541.4 *2*	0.3	2211.83	9⁺	1670.42	8⁺		
550.6 *2*	0.2	2041.17	8⁺	1490.43	7⁺		
563.2 *1*	0.5 *1*	1887.88	7⁺	1324.69	6⁺	E2	DCO=1.00 *20*
564.6 *2*	0.4 *1*	1939.56	9⁻	1375.04	10⁺		DCO=1.5 *3*
569.1 *1*	2.4 *1*	1752.12	6⁺	1182.97	5⁺		DCO=1.40 *23* Mult.: 2006Ap01 report %M1<7.
569.3 *1*	1.1 *1*	1490.43	7⁺	921.20	8⁺	E2(+M1)	DCO=1.58 *12*
572.8 *1*	0.8 *1*	1535.82	4⁺	963.02	3⁺	E2(+M1)	DCO=1.28 *18* Mult.: 2006Ap01 report %M1<11.
573.4 *1*	1.2 *1*	1634.63	5⁺	1061.20	4⁺	E2+M1	DCO=1.5 *3* Mult.: 2006Ap01 report %M1<17.
583.9 *1*	0.8 *1*	1959.00	9⁻	1375.04	10⁺		DCO=1.8 *3*
591.0 *2*	2.7 *4*	2492.41	14⁺	1901.48	12⁺		DCO=1.00 *11*
602.7 *2*	0.5 *1*	2504.15	11⁻	1901.48	12⁺		DCO=1.9 *7*
610.7 *2*	0.3	3146.06	14⁺	2535.21	12⁺		
633.6 *2*	1.5 *2*	2535.21	12⁺	1901.48	12⁺		DCO=0.92 *9*
634.1 *1*	1.9 *1*	1182.97	5⁺	548.67	6⁺	E2	DCO=1.23 *9*
647.2 *2*	0.4 *1*	3139.6	16⁺	2492.41	14⁺		DCO=1.09 *14*

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^{160}Gd(α,2nγ) 2006Ap01,1982Fi15 (continued)

γ(^{162}Dy) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	Comments
647.5 1	1.5 1	1535.82	4+	888.25	2+	E2(+M1)	DCO=1.04 13 Mult.: 2006Ap01 report %M1<5.6.
654.4 2	0.8 2	3146.8?	15−	2492.41	14+		DCO=1.51 23
671.4 2	1.3 2	1634.63	5+	963.02	3+	E2	DCO=1.01 21
691.0 1	1.8 1	1752.12	6+	1061.20	4+		DCO=1.07 25 E_γ: γ not reported by 2006Ap01 in (n,γ).
692.7 2	‡	3832.3	18+	3139.6	16+		
697.2 1	0.9 1	963.02	3+	265.79	4+	E2+M1	DCO=0.98 9 Mult.: 2006Ap01 report %E2=94.8.
704.9 1	0.4 1	1887.88	7+	1182.97	5+	E2	DCO=1.2 3
712.6 1	1.6 1	2087.67	10+	1375.04	10+		DCO=1.30 16
716.3 1	0.7 1	1637.46	7−	921.20	8+		DCO=1.74 17
722.0 1	0.5 1	2623.46	12+	1901.48	12+		DCO=1.2 4
725.5 2	0.4 1	2100.67	9−	1375.04	10+		DCO=1.7 5
728.4 2	‡	1691.42	2−	963.02	3+		
749.2 1	2.6 1	1670.42	8+	921.20	8+	E2(+M1)	DCO=1.47 7
762.1 2	1.1 2	1683.56	7−	921.20	8+		DCO=1.36 8
776.0 1	3.2 3	1324.69	6+	548.67	6+	E2+M1	DCO=1.41 7 Mult.: 2006Ap01 report %E2=98, but placement requires pure E2.
781.8 2	2.4 3	2683.10	13−	1901.48	12+		DCO=1.90 23
795.4 1	3.0 3	1061.20	4+	265.79	4+	E2+M1	DCO=1.09 5 Mult.: 2006Ap01 report %E2=90.
801.9 2	0.9 1	3294.3?	15−	2492.41	14+		DCO=2.2 5
807.5 1	2.6 2	888.25	2+	80.75	2+	E2+M1	DCO=0.93 18 Mult.: 2006Ap01 report %E2=96.7.
819.4 2	‡	1782.42	2+	963.02	3+		
842.6 1	1.2 2	1391.13	5−	548.67	6+		DCO=1.3 3
846.2 2	0.7 1	1767.36	6+	921.20	8+	E2	DCO=1.4 3
857.5 3	‡	1745.8	1+	888.25	2+		
877.1 1	2.0 2	2778.58	13−	1901.48	12+		DCO=1.76 18
882.3 1	5.8 4	963.02	3+	80.75	2+	E2+M1	DCO=0.82 10 Mult.: 2006Ap01 report %E2=99.3.
887.3 1	1.5 1	2262.39	10+	1375.04	10+		DCO=0.92 6
888.2 1	2.4 2	888.25	2+	0.0	0+	E2	DCO=0.98 10
906.0 1	2.9 1	2281.02	11−	1375.04	10+		DCO=1.83 9
917.2 1	6.7 3	1182.97	5+	265.79	4+	E2+M1	DCO=1.14 3 Mult.: 2006Ap01 report %E2=96.2.
937.2 1	2.2 2	1485.92	5−	548.67	6+		DCO=1.30 6
941.9 1	6.8 7	1490.43	7+	548.67	6+	M1	DCO=1.41 4 Mult.: from 1982Fi15, α(K)exp=0.0034 5, which gives mult=E2 with δ>1.2.
944.5 4	0.3	1210.26	3−	265.79	4+		
956.9 1	2.6 2	1878.03	9+	921.20	8+	E2(+M1)	DCO=1.58 9
957.0 1	2.5 1	2332.01	11−	1375.04	10+		DCO=1.87 10
958.2 2	0.7 1	2859.66	13+	1901.48	12+		DCO=1.05 16
962.4 2	1.4 2	2337.30	11+	1375.04	10+		DCO=1.37 20
970.2 3	1.1 3	1518.68	5−	548.67	6+		DCO=1.7 3
980.5 1	1.9 3	1061.20	4+	80.75	2+	[E2]	DCO=0.99 19 Mult.: 2006Ap01 report %E2=93, but placement requires pure E2.
1018.3 1	2.5 3	1939.56	9−	921.20	8+		DCO=1.72 14
1033.9 2	0.8 2	2935.33	14+	1901.48	12+		DCO=1.4 4
1038.0 1	3.2 4	1959.00	9−	921.20	8+		DCO=1.75 13
1059.0 2	1.7 1	1324.69	6+	265.79	4+	E2	DCO=0.92 6

Continued on next page (footnotes at end of table)

^{160}Gd(α,2nγ) 2006Ap01,1982Fi15 (continued)

γ(^{162}Dy) (continued)

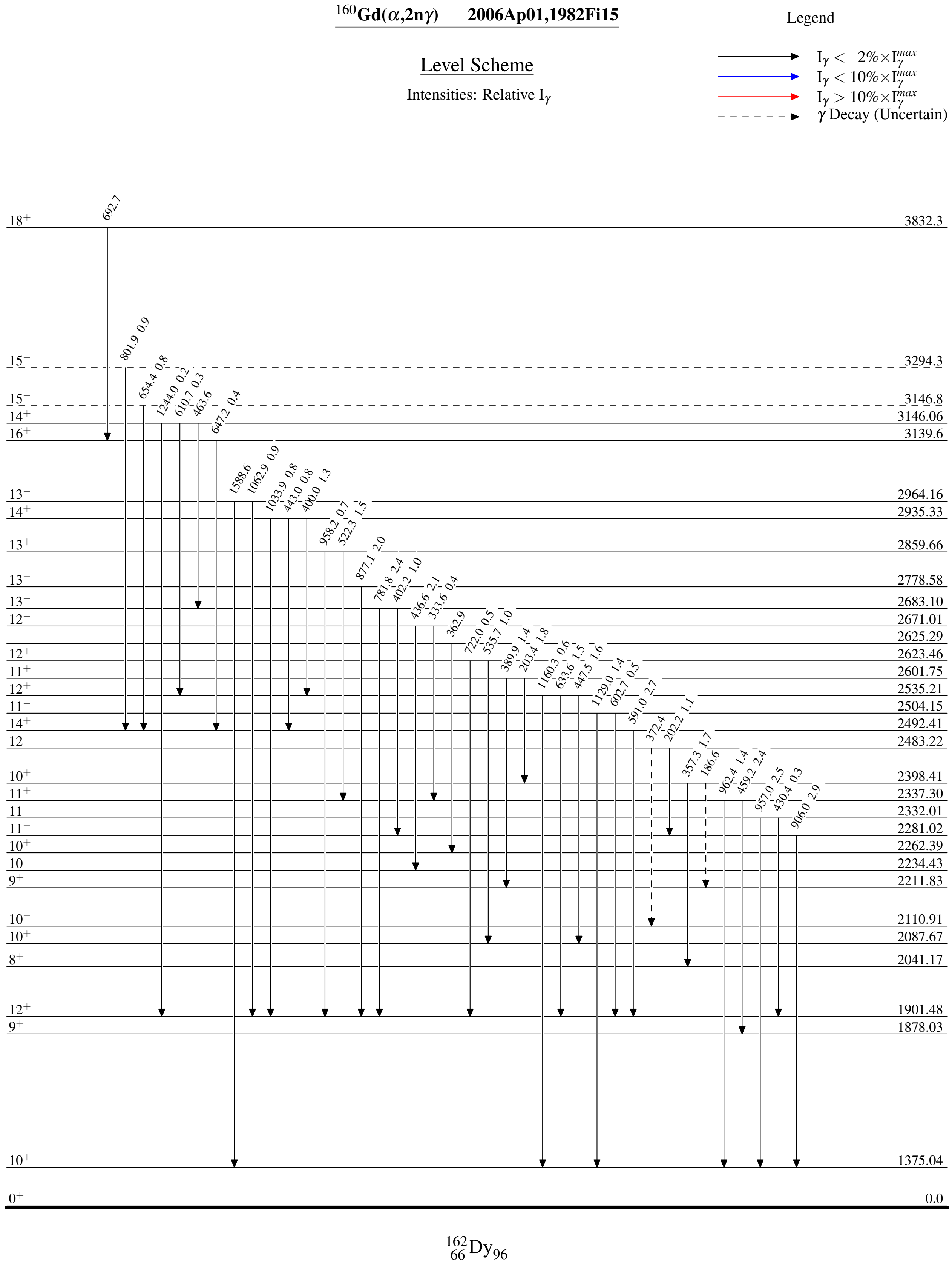
E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	Comments
1062.9 *2*	0.9 *1*	2964.16	13^-	1901.48	12^+		DCO=1.7 *4*
1064.6 *2*	2.4 *3*	1985.63	8^+	921.20	8^+		DCO=1.00 *11*
1088.6 *2*	2.0 *2*	1637.46	7^-	548.67	6^+	E1	DCO=1.66 *11* Mult.: from α(K)exp=0.0004 *1* (1982Fi15).
1091.9 *2*	0.6 *2*	1357.69	3^-	265.79	4^+		DCO=1.30 *24*
1121.8 *2*	1.6 *3*	1670.42	8^+	548.67	6^+	E2	DCO=1.04 *7*
1125.0 *2*	1.7 *3*	1391.13	5^-	265.79	4^+		DCO=1.44 *12*
1129.0 *4*	1.4 *2*	2504.15	11^-	1375.04	10^+		DCO=1.74 *19*
1129.5 *2*	0.6 *2*	1210.26	3^-	80.75	2^+		DCO=1.5 *4*
1134.7 *2*	3.7 *4*	1683.56	7^-	548.67	6^+		DCO=1.38 *6*
1160.3 *3*	0.6 *1*	2535.21	12^+	1375.04	10^+		DCO=1.06 *17*
1166.4 *3*	0.9 *2*	2087.67	10^+	921.20	8^+		DCO=0.93 *9*
1179.6 *2*	2.2 *5*	2100.67	9^-	921.20	8^+		DCO=1.60 *13*
1207.0 *4*	<0.3	1755.7	$(7)^-$	548.67	6^+		
1218.6 *3*	1.5 *2*	1767.36	6^+	548.67	6^+	E2+M1	DCO=2.13 *21*
1220.2 *2*	4.4 *5*	1485.92	5^-	265.79	4^+		DCO=1.35 *7*
1244.0 *4*	0.2	3146.06	14^+	1901.48	12^+		
1252.8 *2*	1.0 *3*	1518.68	5^-	265.79	4^+		DCO=1.38 *20*
1308.4 *3*	0.4 *1*	1574.2	4^+	265.79	4^+	M1,E2	
1588.6 *3*	‡	2964.16	13^-	1375.04	10^+		
1608.8 *3*	0.6 *2*	2157.5?		548.67	6^+		DCO=1.5 *3*

† From Table 3 of 2006Ap01, unless noted otherwise.

‡ Weak transition (2006Ap01).

\# DCO ratios of 2006Ap01 measured by gating on ΔJ=2, Q transitions, unless noted otherwise. DCO ratios of 1.0 are expected for Q transitions gated on stretched Q transitions and for D transitions gated on stretched D transitions. 2006Ap01 use these data primarily to differentiate between stretched transitions and those of mixed multipolarity. The only mults shown are those listed explicitly by 2006Ap01 (in their tables 4 and 5). For the mults and δ values based on all the available data, see the Adopted Gammas data set.

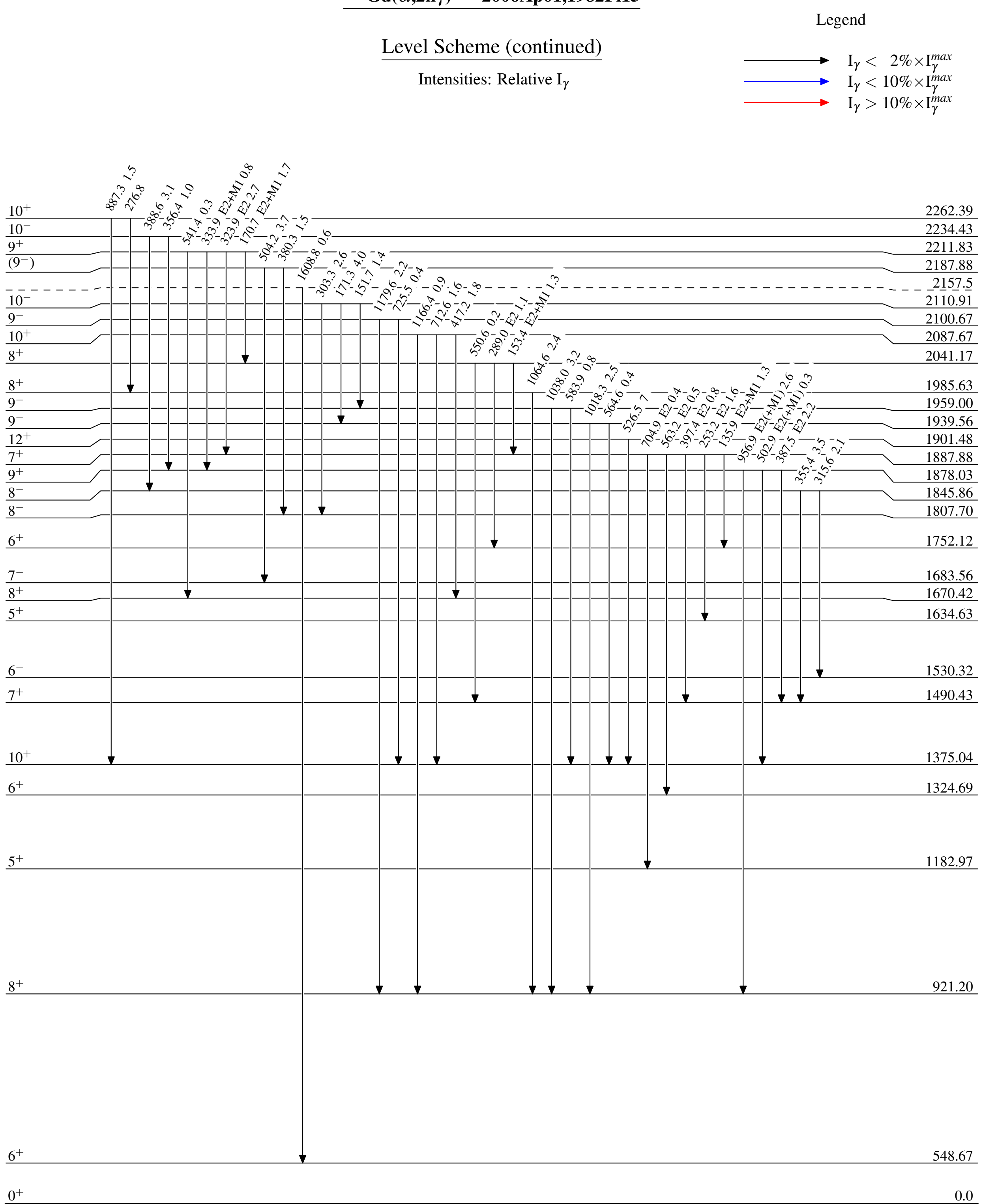
@ Placement of transition in the level scheme is uncertain.


^{160}Gd(α,2nγ) 2006Ap01,1982Fi15
Legend
Level Scheme
Intensities: Relative I_γ
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)
18+ 3832.3
15− 3294.3
15− 3146.8
14+ 3146.06
16+ 3139.6
13− 2964.16
14+ 2935.33
13+ 2859.66
13− 2778.58
13− 2683.10
12− 2671.01
2625.29
12+ 2623.46
11+ 2601.75
12+ 2535.21
11− 2504.15
14+ 2492.41
12− 2483.22
10+ 2398.41
11+ 2337.30
11− 2332.01
11− 2281.02
10+ 2262.39
10− 2234.43
9+ 2211.83
10− 2110.91
10+ 2087.67
8+ 2041.17
12+ 1901.48
9+ 1878.03
10+ 1375.04
0+ 0.0
692.7
801.9 0.9
654.4 0.8
1244.0 0.2
610.7 0.3
463.6
647.2 0.4
1588.6
1062.9 0.9
1033.9 0.8
443.0 0.8
400.0 1.3
958.2 0.7
522.3 1.5
877.1 2.0
781.8 2.4
402.2 1.0
436.6 2.1
333.6 0.4
362.9
722.0 0.5
535.7 1.0
389.9 1.4
203.4 1.8
1160.3 0.6
633.6 1.5
447.5 1.6
1129.0 1.4
602.7 0.5
591.0 2.7
372.4
202.2 1.1
357.3 1.7
186.6
962.4 1.4
459.2 2.4
957.0 2.5
430.4 0.3
906.0 2.9
$^{162}_{66}Dy_{96}$

^{160}Gd(α,2nγ) 2006Ap01,1982Fi15

Level Scheme (continued)

Intensities: Relative I_γ

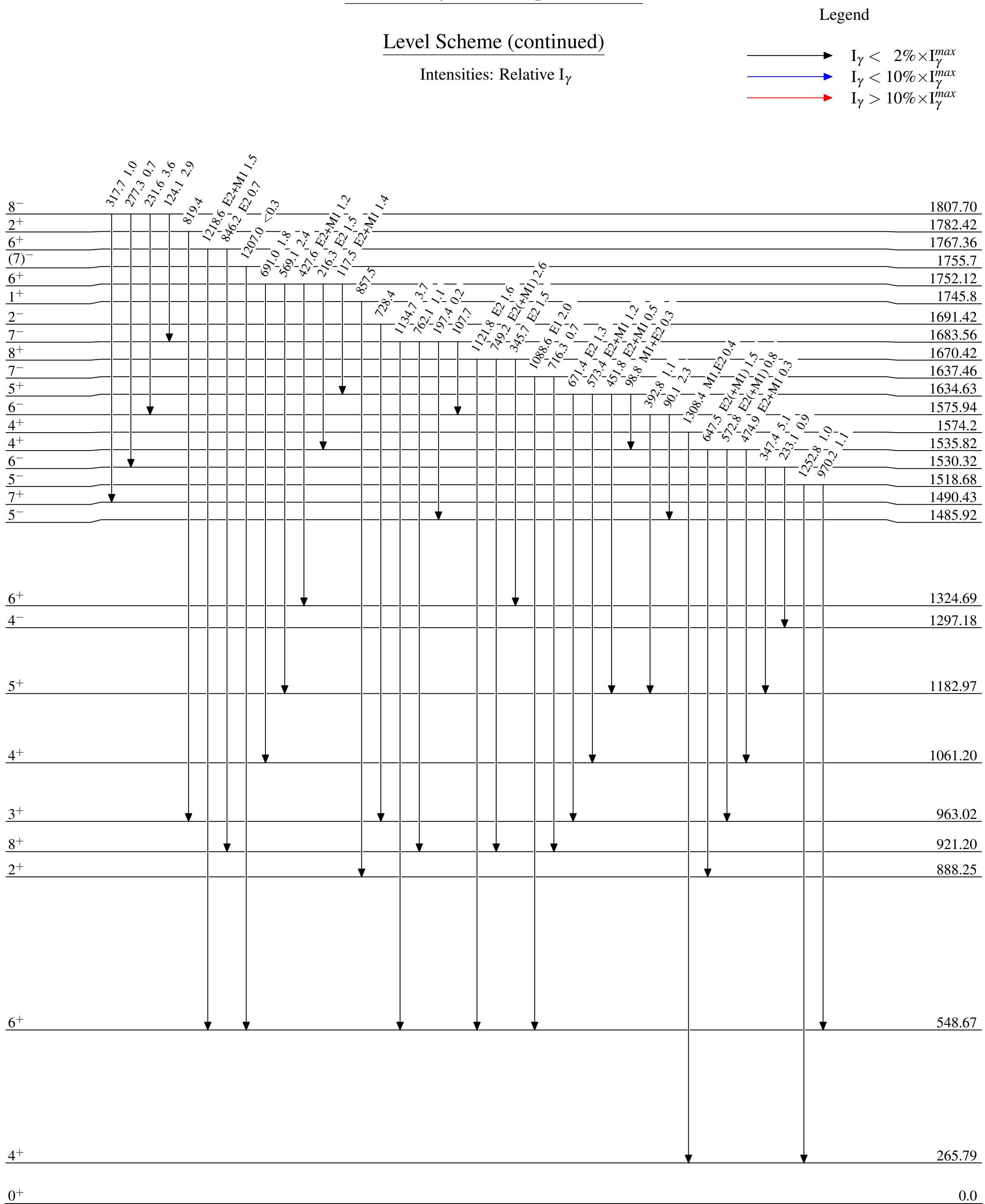


$^{162}_{66}Dy_{96}$

^{160}Gd(α,2nγ) 2006Ap01,1982Fi15

Level Scheme (continued)

Intensities: Relative I_γ



$^{162}_{66}Dy_{96}$

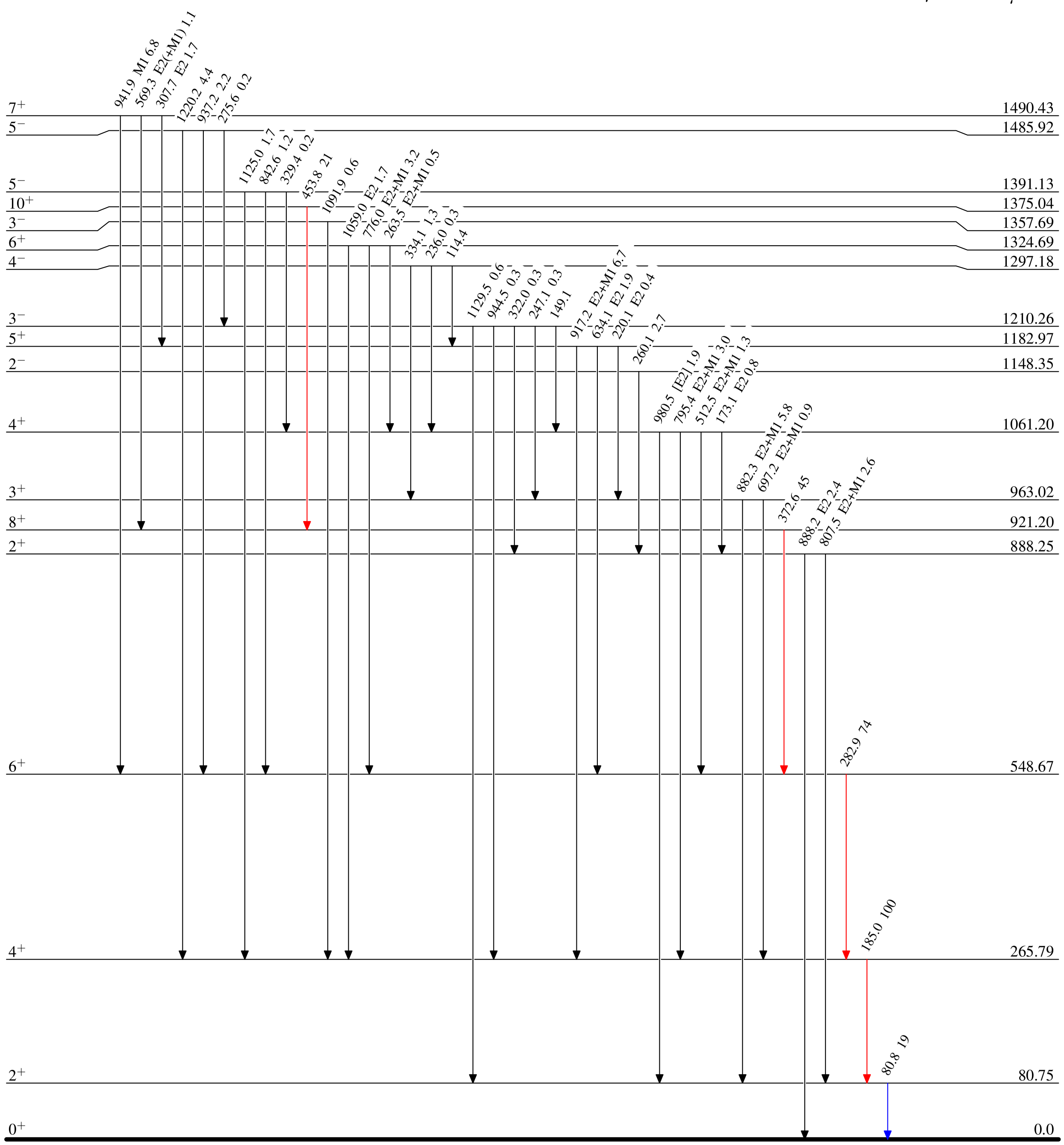
^{160}Gd(α,2nγ) 2006Ap01,1982Fi15

Level Scheme (continued)

Intensities: Relative I_γ

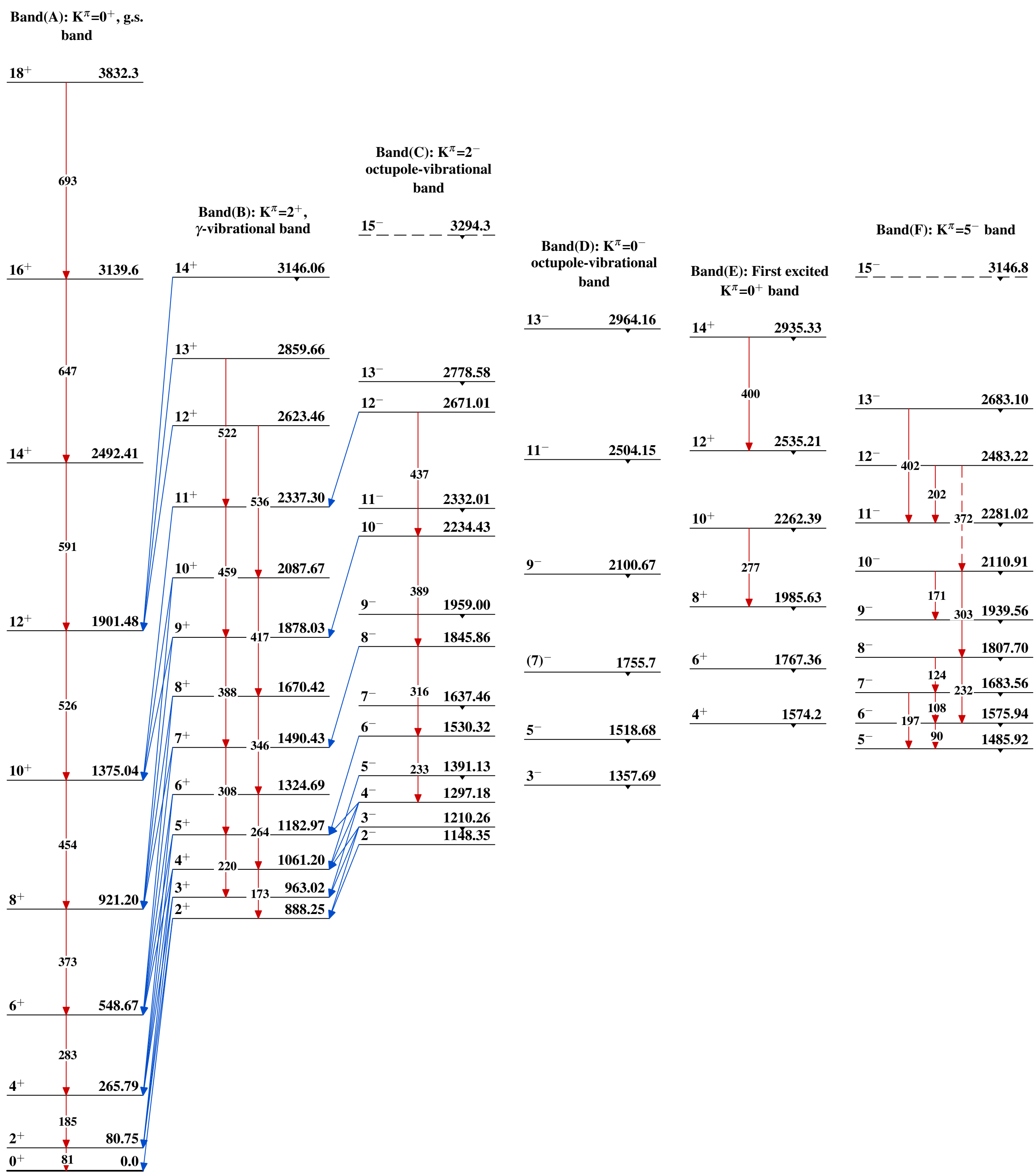
Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$



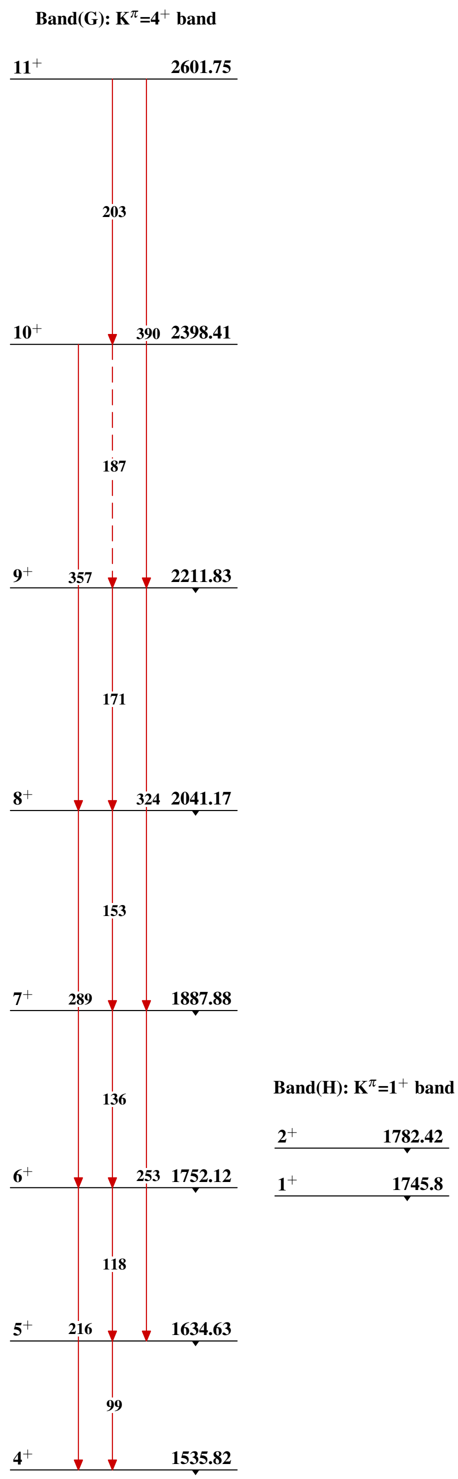
$^{162}_{66}Dy_{96}$

$^{160}Gd(\alpha,2n\gamma)$ 2006Ap01,1982Fi15



$^{162}_{66}Dy_{96}$

^{160}Gd(α,2nγ) 2006Ap01,1982Fi15 (continued)



$^{162}_{66}Dy_{96}$