

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 114, 1497 (2013)	31-Aug-2013

$Q(\beta^-) = -6513$ 13; $S(n) = 9437$ 5; $S(p) = 5783$ 6; $Q(\alpha) = 3727$ 4 [2017Wa10](#)

$Q(\epsilon) = 6.0 \times 10^2$ 4; $S(2n) = 16951$ 5; $S(2p) = 8932$ 6 [2017Wa10](#)

[Additional information 1.](#)

[Additional information 2.](#)

[1993Ga10](#) ([1993Ra08](#)) present evidence for a hyperdeformed band from the reaction $^{120}\text{Sn}(^{37}\text{Cl}, p4n\gamma)^{152}\text{Dy}$ or $^{120}\text{Sn}(^{37}\text{Cl}, p3n\gamma)^{153}\text{Dy}$, consisting of a cascade of stretched quadrupole (from DCO ratio) gammas with a spacing of 30 keV 3, and tentative discrete transitions of 1237, 1266, 1299, 1327, 1356, 1383, 1411, 1442, 1471, 1501, 1525. The 30 keV γ -ray spacing leads to $\beta_2 \geq 0.9$, consistent with a hyperdeformed prolate shape with major-to-minor axis ratio of 3:1. The estimated spins of this band ranged from 78 to 98 (if dynamic moment of inertia=static moment of inertia) to 60 to 80 (from total Routhian surface calculation). [1995Vi02](#) ([1995Lu03](#), [1997Lu11](#)) found evidence for a similar HD band, and assigned it to ^{152}Dy by showing that the 30 keV γ -ray ridge is in coin with ^{152}Dy γ 's above the 17⁺, 60-ns isomer. The intensity of this band was $\approx 10\%$ of that for SD-1 band. This band is omitted here since its existence has not been confirmed in more recent work with better statistics ([1996TwZZ](#), [1997Lu05](#), [1997Lu11](#), [1997Sm11](#), [2000Ri03](#)).

See [2000Sm03](#) for suggested structure of the non SD bands.

¹⁵²Dy Levels

Cross Reference (XREF) Flags

A	¹⁵² Ho ϵ decay (161.8 s)	D	¹⁰⁸ Pd(⁴⁸ Ca, 4n γ):SD
B	¹⁵² Ho ϵ decay (50.0 s)	E	¹⁵⁶ Er α decay
C	Gd(α , xn γ), (Hl, xn γ)		

E(level) [†]	J π [‡]	T _{1/2} [#]	XREF	Comments
0.0 ^f	0 ⁺	2.38 h 2	ABCDE	$\% \epsilon + \% \beta^+ = 99.900$ 7; $\% \alpha = 0.100$ 7 T _{1/2} : weighted average of 2.41 h 5 (1962Si14) and 2.37 h 2 (1965Ma51). Others: 2.55 h 17 (1972F109), 1960Ba31 , 1958To27 , 1957Su23 , 1953Ra02 . $\% \alpha$: from 1974To07 . $\langle r^2 \rangle^{1/2} = 5.10$ fm 22 (2004An14).
613.83 ^f 5	2 ⁺	10 ps 5	ABC	J π : E2 γ to 0 ⁺ g.s.
1227.83 ^g 16	3 ⁻		ABC	J π : E2 γ from 5 ⁻ level; γ to 2 ⁺ level.
1261.20 ^f 8	4 ⁺	10.6 ps 16	ABC	J π : E2, $\Delta J = 2$ γ to 2 ⁺ level; g.s. rotational band.
1313.7 3	(2 ⁺)		AB	J π : γ to g.s.: J π =1, 2 ⁺ ; γ from 4 ⁺ level.
1448.2 5	(2 ⁺)		A	J π : (E2) γ to g.s.
1452.8 4	1 ⁺ , 2 ⁺		A	J π : γ to g.s.: J=1, 2 ⁺ ; E2 γ to 2 ⁺ level.
1697.9 5	1 ⁻		A	J π : E1 γ to g.s.
1750.71 20	4 ⁺		AB	J π : M1 γ to 4 ⁺ level; γ to 2 ⁺ level; γ from 6 ⁺ level.
1781.90 11	5 ⁻		BC	J π : E1, $\Delta J = 1$ γ to 4 ⁺ level; γ from 6 ⁺ level.
1840.6 5	1 ⁻ , 2 ⁻ , 3 ⁻		A	J π : E1 γ to 2 ⁺ level.
1944.60 ^f 10	6 ⁺	5.1 ps 21	BC	J π : E2, $\Delta J = 2$ γ to 4 ⁺ level; g.s. rotational band.
2071.02 14	6 ⁺		B	J π : E2 γ to 4 ⁺ . E2 γ from 8 ⁺ .
2296.56 13	(7 ⁺)		B	J π : M1 and (M1) γ 's to 6 ⁺ levels; no γ 's to levels with J<6.
2342.63 11	7 ⁻		BC	J π : E2, $\Delta J = 2$ γ to 5 ⁻ level; E1 γ to 6 ⁺ level.
2437.42 ^f 12	8 ⁺	10 ps 3	BC	J π : E2 γ to 6 ⁺ level; log ft=4.56 for ϵ decay from 9 ⁺ ¹⁵² Ho.
2703.09 ^h 12	8 ⁺		BC	J π : E2 γ to 6 ⁺ level; log ft=5.26 for ϵ decay from 9 ⁺ ¹⁵² Ho.
2726.7 6	(8 ⁻)		B	J π : M1 γ to 7 ⁻ level; no γ 's to levels with J<7.
2906.05 13	9 ⁻		BC	J π : E2, $\Delta J = 2$ γ to 7 ⁻ level; log ft=5.79 for ϵ decay from 9 ⁺ ¹⁵² Ho.
2930.1 6	(7 ⁻)		B	J π : E1 γ to 6 ⁺ level; no γ 's to levels with J<6.
3149.7 6	8 ⁻		B	J π : E1 γ to 7 ⁺ level; log ft=6.18 (log ft ^u t=7.71) for ϵ decay from 9 ⁺ ¹⁵² Ho.

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Adopted Levels, Gammas (continued) ^{152}Dy Levels (continued)

E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments
3160.63 19	(10) ⁻	3.9 ns 9	CD	J ^π : See comment in Gd(α ,xn γ), (HI,xn γ).
3172.8 4	(10) ⁻		BC	J ^π : (M1) γ to 9 ⁻ level; no γ to levels with J<9.
3173.37 ^f 15	10 ⁺		BC	J ^π : E2, $\Delta J=2$ γ to 8 ⁺ level; log $ft=5.77$ for ε decay from 9 ⁺ ^{152}Ho .
3183.69 18	10 ⁺		BC	J ^π : E2, $\Delta J=2$ γ to 8 ⁺ level; log $ft=5.72$ for ε decay from 9 ⁺ ^{152}Ho .
3227.6 4	8 ⁻		B	J ^π : E1 γ to 7 ⁺ level; log $ft=5.97$ (log $f^{\text{th}}t=7.49$) for ε decay from 9 ⁺ ^{152}Ho .
3244.0 4	(9) ⁺		B	J ^π : E2 γ to 7 ⁺ level; log $ft=6.08$ for ε decay from 9 ⁺ ^{152}Ho .
3395.19 ^h 15	10 ⁺		C	
3487.1 ^j 10	(11) ⁻		C	J ^π : Probable $\Delta J=3$ E2 γ to 9 ⁻ . Band structure.
3535.0 6	8 ⁻ , 9 ⁻		B	J ^π : E1 γ to 8 ⁺ level; log $ft=5.95$ (log $f^{\text{th}}t=7.42$) for ε decay from 9 ⁺ ^{152}Ho .
3820.20 ^f 18	12 ⁺		BC	J ^π : E2, $\Delta J=2$ γ to 10 ⁺ level; γ to 11 ⁻ level.
3969.22 24	(12) ⁻		C	J ^π : $\Delta J=2$, E2 γ to (10 ⁻).
3992.0 4	(12) ⁻		C	J ^π : γ to (10) ⁻ level; γ from (14 ⁻) level.
4015.8 6	8 ⁺		B	J ^π : M1 γ to 7 ⁺ level; log $ft=5.99$ for ε decay from 9 ⁺ ^{152}Ho .
4016.89 ^h 18	12 ⁺		C	
4125.6 ^j 11	(13) ⁻		C	
4135.1 6			C	
4430.20 ^f 20	14 ⁺		C	J ^π : E2, $\Delta J=2$ γ to 12 ⁺ level; γ to 13 ⁻ level.
4495.0 ⁱ 9	(12) ⁻		C	J ^π : Assigned as 12 ⁻ by 2000Sm03 on the basis of excitation energy arguments.
4650.49 ^g 21	14 ⁺		C	
4659.0 9	(14) ⁻		C	J ^π : The 690 γ is assumed by 2000Sm03 to be $\Delta J=2$, E2.
4734.5 3	(13 ⁺ , 14 ⁻)		C	J ^π : γ to (12 ⁻) level; γ from 15 ⁺ level.
4804.87 24	13 ⁺ , 14 ⁺		C	J ^π : γ to 12 ⁺ . γ from 15 ⁺ .
4817.7 ^j 11	(15) ⁻		C	
5034.79 21	15 ⁺		C	J ^π : M1, $\Delta J=1$ γ to 14 ⁺ level.
5088.1 3	17 ⁺		C	J ^π : E2 γ to 15 ⁺ . No transition to J<15. If J ^π were 16 ⁺ , for example, one would have B(E2)(W.u.)=0.0016xBRANCHING, where branching is the branching ratio for the unobserved 658 γ to the 14 ⁺ 4430 level.
5177.7 ⁱ 8	(14) ⁻		C	
5215.59 ^h 23	16 ⁺		C	
5341.7 3	18 ⁺		C	J ^π : M1, $\Delta J=1$ γ to 17 ⁺ level; no γ 's to levels with J<17.
5531.7 ^j 11	(17) ⁻		C	
5762.20 ^h 25	18 ⁺		C	
5867.0 4	19 ⁻		C	J ^π : E1, $\Delta J=1$ γ to 18 ⁺ level; no γ to level with J<18.
5884.3 ⁱ 8	(16) ⁻		C	
6051.6 6	(20 ⁺)		C	J ^π : stretched Q γ to 18 ⁺ level.
6111.4 4	(20 ⁺)		C	J ^π : stretched Q γ to 18 ⁺ level.
6129.4 4	21 ⁻		C	$\mu=+11.6$ I2 (1979Me01, 2005St24) J ^π : E2, $\Delta J=2$ γ to 19 ⁻ level; no γ to level with J<19. μ : TDPAD method (1979Me01).
6171.8 4			C	
6225.4 ^j 5	(20)		C	J ^π : (D) γ to 19 ⁻ level.
6258.5 ^j 11	(19) ⁻		C	
6370.3 ^h 3	20 ⁺		C	
6536.0 11			C	
6625.1 ⁱ 8	(18) ⁻		C	
6737.0 5	(22 ⁺)		C	J ^π : stretched Q γ to (20 ⁺) level; γ to 21 ⁻ level.
7024.5 ^j 11	(21) ⁻		C	
7050.6 ^h 3	22 ⁺		C	
7120.1 4	23 ⁻		C	J ^π : E2, $\Delta J=2$ γ to 21 ⁻ level; γ to (22 ⁺) level.

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Adopted Levels, Gammas (continued) ^{152}Dy Levels (continued)

E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments
7227.0 10	(24 ⁺)		C	J ^π : stretched Q γ to (22 ⁺) level; no γ to level with J<22.
7413.5 ⁱ 8	(20 ⁻)		C	
7661.3 5	25 ⁻		C	J ^π : E2, ΔJ=2 γ to 23 ⁻ level; no go to level with J<23.
7710.0 10	(24 ⁺)		C	J ^π : γ's to (22 ⁺) and (24 ⁺). No feeding to J<22.
7803.9 ^h 3	24 ⁺	0.64 [@] ps 5	C	
7848.6 ^j 11	(23 ⁻)		C	
7881.9 5	27 ⁻	1.6 ns 2	C	μ=+2.4 14 (2004Fu36) J ^π : E2, ΔJ=2 γ to 25 ⁻ level; no γ to level with J<25.
8185.9 12			C	
8238.7 ⁱ 8	(22 ⁻)		C	
8337.9 12			C	
8628.8 ^h 4	26 ⁺	0.172 [@] ps 14	C	
8735.9 ^j 11	(25 ⁻)		C	
8848.8 6	28 ⁺	24 ps 8	C	J ^π : E1, ΔJ=1 γ to 27 ⁻ level; no γ to level with J<27.
8996.2 6	29 ⁺	35 ps 10	C	J ^π : M1, ΔJ=1 γ to 28 ⁺ level; no γ to level with J<28.
9117.5 ⁱ 8	(24 ⁻)		C	
9180? 2	(26 ⁺ to 30 ⁺)		E	J ^π : γ from (28 ⁺).
9398.6 6	30 ⁺	7 ps 1	C	J ^π : M1, ΔJ=1 γ to 29 ⁺ level; no γ to level with J<29.
9523.0 ^h 4	28 ⁺	0.168 [@] ps 14	C	
9687.9 ^j 11	(27 ⁻)		C	
10012.3 8			C	
10048.5 ⁱ 8	(26 ⁻)		C	
10110.2 6	31 ⁺		C	J ^π : M1, ΔJ=1 γ to 30 ⁺ level; E2, ΔJ=2 γ to 29 ⁺ level.
10257.2 9			C	
10484.3 ^h 4	30 ⁺	0.112 [@] ps 7	C	
10541.1 7	(32 ⁺)	6.2 ps 6	C	J ^π : (M1) γ to 31 ⁺ level; γ to 30 ⁺ level.
10643.0 ^{&} 16	(24 ⁺)		E	Q(intrinsic)=17.5 +4-2 (1997Ni01), 17.5 2 (1996Sa15), 18 3 (1991Be12). J ^π : J ^π =24 ⁺ proposed by 1994Da20. Theoretical analysis suggests J=24 or 26 (1993Ra07).
10705.3 ^j 11	(29 ⁻)		C	
10795.1 7	(33 ⁺)	15 ps 5	C	J ^π : Q γ to 31 ⁺ level; D γ to (32 ⁺) level.
10961.0 9			C	
11032.7 ⁱ 8	(28 ⁻)		C	
11209.0 8			C	
11245.4 ^{&} 16	(26 ⁺)		E	
11395.4 10			C	
11442.9 9			C	
11511.9 ^h 4	32 ⁺	0.063 [@] ps 7	C	
11574.6 7	(34 ⁻)		C	J ^π : E1, ΔJ=1 γ to (33 ⁺) level.
11602.1 9			C	
11788.7 ^j 11	(31 ⁻)		C	
11793.0 11			C	
11859.0 9			C	
11892.9 ^{&} 16	(28 ⁺)		E	
11963.2 8	(35 ⁻)	1.2 ps 4	C	J ^π : M1, ΔJ=1 γ to (34 ⁻) level.
12071.9 ⁱ 8	(30 ⁻)		C	
12178.9 9			C	
12325.1 10	(36 ⁻)		C	J ^π : D, ΔJ=1 γ to (35 ⁻) level; γ to (34 ⁻) level.
12428.7 9			C	
12585.6 ^{&} 16	(30 ⁺)	30 fs	E	
12604.3 ^h 4	34 ⁺	0.056 [@] ps 7	C	

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Adopted Levels, Gammas (continued) ^{152}Dy Levels (continued)

E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments
12716.9 <i>10</i>			C	
12938.2 <i>j 11</i>	(33 ⁻)		C	
12946.2 <i>13</i>			C	
13048.9 <i>11</i>			C	
13117.1 <i>14</i>			C	
13169.0 <i>i 9</i>	(32 ⁻)		C	
13253.4 <i>14</i>			C	
13323.7 <i>& 16</i>	(32 ⁺)	22 fs	E	
13396.7 <i>10</i>			C	
13493.1 <i>14</i>			C	
13517.1 <i>14</i>			C	
13687.1 <i>14</i>			C	
13721.9 <i>14</i>			C	
13762.7 <i>h 4</i>	36 ⁺	0.035 [@] ps 7	C	
14107.7 <i>& 16</i>	(34 ⁺)	16 fs	E	
14154.1 <i>j 11</i>	(35 ⁻)		C	
14237.4 <i>e 17</i>	(31 ⁻)		E	
14325.3 <i>i 9</i>	(34 ⁻)		C	
14484.9 <i>17</i>			C	
14663.2 <i>17</i>			C	
14741.9 <i>17</i>			C	
14937.6 <i>& 16</i>	(36 ⁺)	12 fs	E	
14984.0 <i>h 4</i>	38 ⁺	0.077 [@] ps 7	C	
14998.9 <i>e 17</i>	(33 ⁻)		E	
15435.6 <i>j 11</i>	(37 ⁻)		C	
15543.0 <i>i 9</i>	(36 ⁻)		C	
15803.4 <i>e 17</i>	(35 ⁻)		E	
15814.1 <i>& 16</i>	(38 ⁺)	9.3 fs	E	
16267.0 <i>h 5</i>	40 ⁺	0.063 [@] ps 14	C	
16397.0 <i>20</i>			C	
16653.0 <i>e 17</i>	(37 ⁻)		E	
16737.3 <i>& 16</i>	(40 ⁺)	7.1 fs	E	
16778.9 <i>j 11</i>	(39 ⁻)		C	
16824.4 <i>i 9</i>	(38 ⁻)		C	
17539.0 <i>22</i>			C	
17547.9 <i>e 17</i>	(39 ⁻)		E	
17608.6 <i>h 5</i>	(42 ⁺)	<0.021 [@] ps	C	J ^π : member of rotational band.
17707.5 <i>& 16</i>	(42 ⁺)	5.5 fs	E	
18172.1 <i>i 9</i>	(40 ⁻)		C	
18179.2 <i>j 11</i>	(41 ⁻)		C	
18489.0 <i>e 17</i>	(41 ⁻)		E	
18724.9 <i>& 17</i>	(44 ⁺)	4.4 fs	E	
19008.4 <i>h 5</i>	(44 ⁺)	<0.021 [@] ps	C	J ^π : member of rotational band.
19475.1 <i>e 17</i>	(43 ⁻)		E	
19590.2 <i>i 11</i>	(42 ⁻)		C	
19789.8 <i>& 17</i>	(46 ⁺)	3.5 fs	E	
20467.4 <i>h 5</i>	(46 ⁺)	<0.021 [@] ps	C	J ^π : member of rotational band.
20506.5 <i>e 17</i>	(45 ⁻)		E	
20902.5 <i>& 17</i>	(48 ⁺)	2.8 fs	E	
21077.8 <i>i 12</i>	(44 ⁻)		C	

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Adopted Levels, Gammas (continued) ^{152}Dy Levels (continued)

E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments
21583.8 ^e 17	(47 ⁻)		E	
22063.0 ^{&} 17	(50 ⁺)	2.3 fs	E	
22706.5 ^e 17	(49 ⁻)		E	
23271.6 ^{&} 17	(52 ⁺)	1.8 fs	E	
23873.6 ^e 17	(51 ⁻)		E	
24528.2 ^{&} 17	(54 ⁺)	1.5 fs	E	
25085.2 ^e 17	(53 ⁻)		E	
25833.0 ^{&} 17	(56 ⁺)	1.2 fs	E	
26341.9 ^e 18	(55 ⁻)		E	
27185.9 ^{&} 17	(58 ⁺)	1.0 fs	E	
27641.8 ^e 18	(58 ⁻)		E	
28587.2 ^{&} 17	(60 ⁺)	0.90 fs	E	
28986.1 ^e 18	(59 ⁻)		E	
30036.8 ^{&} 17	(62 ⁺)	0.69 fs	E	
30374.5 ^e 18	(61 ⁻)		E	
31534.6 ^{&} 17	(64 ⁺)		E	
31808.0 ^e 21	(63 ⁻)		E	
33080.2 ^{&} 18	(66 ⁺)		E	
33286.1 ^e 23	(65 ⁻)		E	
34660.2 ^{&} 21	(68 ⁺)		E	
x ^a	(34)		E	Additional information 3.
825.9+x ^a 10	(36)		E	
1681.3+x ^a 11	(38)		E	
2576.5+x ^a 11	(40)		E	
3508.7+x ^a 11	(42)		E	
4478.6+x ^a 12	(44)		E	
5487.1+x ^a 13	(46)		E	
6536.3+x ^a 13	(48)		E	
7628.9+x ^a 13	(50)		E	
8766.5+x ^a 14	(52)		E	
9949.9+x ^a 14	(54)		E	
11180.5+x ^a 14	(56)		E	
12458.2+x ^a 14	(58)		E	
13785.7+x ^a 15	(60)		E	
15162.8+x ^a 18	(62)		E	
16586.4+x ^a 21	(64)		E	
18063.5+x ^a 23	(66)		E	
y ^b	(36)		E	Additional information 4.
793.00+y ^b 20	(38)		E	
1632.7+y ^b 3	(40)		E	
2523.9+y ^b 4	(42)		E	
3468.7+y ^b 4	(44)		E	
4466.9+y ^b 5	(46)		E	
5519.3+y ^b 5	(48)		E	
6624.2+y ^b 6	(50)		E	
7781.1+y ^b 6	(52)		E	
8989.0+y ^b 6	(54)		E	
10249.4+y ^b 7	(56)		E	

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Adopted Levels, Gammas (continued) ^{152}Dy Levels (continued)

E(level) [†]	J ^{π‡}	XREF	Comments
11563.2+y ^b 7	(58)	E	
12931.9+y ^b 7	(60)	E	
14357.7+y ^b 8	(62)	E	
15840.4+y ^b 8	(64)	E	
17384.5+y ^b 8	(66)	E	
18989.2+y ^b 8	(68)	E	
z ^c	(27 ⁻)	E	Additional information 5.
669.6+z ^c 5	(29 ⁻)	E	
1390.6+z ^c 6	(31 ⁻)	E	
2163.4+z ^c 6	(33 ⁻)	E	
2988.4+z ^c 6	(35 ⁻)	E	
3865.2+z ^c 7	(37 ⁻)	E	
4794.2+z ^c 7	(39 ⁻)	E	
5772.9+z ^c 7	(41 ⁻)	E	
6802.7+z ^c 8	(43 ⁻)	E	
7883.5+z ^c 8	(45 ⁻)	E	
9014.1+z ^c 8	(47 ⁻)	E	
10194.4+z ^c 8	(49 ⁻)	E	
11422.4+z ^c 9	(51 ⁻)	E	
12703.4+z ^c 10	(53 ⁻)	E	
14031.2+z ^c 12	(55 ⁻)	E	
15407.1+z ^c 15	(57 ⁻)	E	
u ^d	(26 ⁻)	E	Additional information 6.
642.1+u ^d 5	(28 ⁻)	E	
1337.0+u ^d 7	(30 ⁻)	E	
2084.0+u ^d 7	(32 ⁻)	E	
2882.8+u ^d 7	(34 ⁻)	E	
3733.9+u ^d 8	(36 ⁻)	E	
4635.2+u ^d 8	(38 ⁻)	E	
5589.0+u ^d 8	(40 ⁻)	E	
6594.1+u ^d 10	(42 ⁻)	E	
7649.1+u ^d 10	(44 ⁻)	E	
8754.1+u ^d 10	(46 ⁻)	E	
9909.9+u ^d 11	(48 ⁻)	E	
11115.7+u ^d 11	(50 ⁻)	E	
12369.5+u ^d 12	(52 ⁻)	E	
13673.7+u ^d 13	(54 ⁻)	E	

[†] From a least-squares fit to the E_γ data. For the fit, E_γ values quoted with no uncertainties are assigned ΔE=0.5 keV when given to the nearest tenth of a keV and ΔE=1 keV when quoted only to the nearest keV.

[‡] In addition to the arguments given, the transitions within the normal bands are ΔJ=2, from γ(θ) and DCO in Gd(α,xnγ),(HI,xnγ). assignments for SD-1 are from 2002La02, those for SD-6 are from 2002La35, and for the other SD bands are from 1994Da20. an implicit assumption is that J increases with level energy, an assumption backed by the absence of transitions to levels with lower J.

[#] From Gd(α,xnγ),(HI,xnγ) for normal deformed levels and from (⁴⁸Ca,4nγ):SD dataset for superdeformed levels, unless otherwise noted.

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Adopted Levels, Gammas (continued) ^{152}Dy Levels (continued)

@ From DSAM in $\text{Gd}(\alpha, \text{xn}\gamma)$, $(\text{HI}, \text{xn}\gamma)$ (2000Sm03).

& Band(A): SD-1 band (1986Tw01, 1994Da20, 1991Be12, 2002La02, 2002La35, 1997Ni01, 1996Sa15, 1995Ce08, 1992Sm01, 1992Mu10). $Q(\text{intrinsic})=17.5 +4-2$ (1997Ni01), 17.5 2 (1996Sa15), 18 4 (1995Ce08), 18 3 (1991Be12). Configuration: $\pi 6^{+4}\nu 7^{+2}$

(1993Cu06, 1991Be12). Percent population in different reactions: 1.47 7 in $(^{48}\text{Ca}, 4n\gamma)$ $E=200$ MeV (1992Sm01); 1.80 15 ($E=317$ MeV), 2.25 19 ($E=328$ MeV), 2.07 20 ($E=339$ MeV) in $^{74}\text{Ge}(^{82}\text{Se}, 4n\gamma)$ (1992Sm01); 1.12 in $^{120}\text{Sn}(^{36}\text{S}, 4n\gamma)$ $E=170$ MeV (1992Sm01); 0.7 2 ($E=160$ MeV), 1.1 3 ($E=170$ MeV) in $^{124}\text{Sn}(^{33}\text{S}, 5n\gamma)$ (1992Mu10).

^a Band(B): SD-2 band (1994Da20). If $\pi=+$, configuration= $(\pi 6^{+4})(\pi 7^{+1})(\pi 1/2[301]^{-1})(\nu 7^{+2})$ (1994Da20). If $\pi=-$, configuration= $(\pi 6^{+3})(\pi 7^{+1})(\pi 3/2[651]^{-1})(\nu 7^{+2})$ (1994Da20). Relative population=7.5% 15 of SD-1 band (1994Da20).

^b Band(C): SD-3 band (1994Da20). Relative population=8.4% 11 of SD-1 band (1994Da20).

^c Band(D): SD-4 band (1994Da20). SD-4 and SD-5 are possible signature partners with configuration= $(\pi 6^{+4})(\nu 7^{+1})(\nu, 5/2[402]^{+1})$ (1994Da20). Relative population=4% 1 of SD-1 band (1994Da20).

^d Band(E): SD-5 band (1994Da20). SD-4 and SD-5 are possible signature partners with configuration= $(\pi 6^{+4})(\nu 7^{+1})(\nu, 5/2[402]^{+1})$ (1994Da20). Relative population=4% 1 of SD-1 band (1994Da20).

^e Band(F): SD-6 band (1994Da20, 2002La35). Possible configuration: $\pi 6^{+4}\nu 7^3$ (yrast SD of ^{153}Dy) coupled to a hole in any of the following neutron orbitals: 1/2[411], 5/2[642], 1/2[651] (1994Da20). Relative population: 5% 1 of SD-1 band (1994Da20). Interconnections of SD-6 to SD-1 band reported by 2002La35 with 53% 8 of the decay of this band proceeding through SD-1 band.

^f Band(G): Quasi-vibrational yrast state.

^g Band(H): Negative parity yrast band built on the 1228 level.

^h Band(I): Positive parity $\Delta J=2$ quasi-rotational band built on the g.s. band.

ⁱ Band(J): Negative parity $\Delta J=2$ band built on the 4495 level.

^j Band(K): Negative parity $\Delta J=2$ band built on the 3487 level.

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$

$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	$I_\gamma^{\ddagger}$	E_f	J_f^π	Mult.#	$\alpha^\ddagger$	Comments
613.83	2 ⁺	613.83 5		0.0	0 ⁺	E2	0.00905	$\alpha(\text{K})=0.00742$ 11; $\alpha(\text{L})=0.001277$ 18; $\alpha(\text{M})=0.000285$ 4; $\alpha(\text{N}+..)=7.50\times 10^{-5}$ 11 $\alpha(\text{N})=6.54\times 10^{-5}$ 10; $\alpha(\text{O})=9.17\times 10^{-6}$ 13; $\alpha(\text{P})=4.22\times 10^{-7}$ 6 B(E2)(W.u.)=13 +14-4
1227.83	3 ⁻	613.7 5		613.83	2 ⁺			
1261.20	4 ⁺	647.37 6		613.83	2 ⁺	E2	0.00797	B(E2)(W.u.)=9.6 +18-12 $\alpha(\text{K})=0.00655$ 10; $\alpha(\text{L})=0.001106$ 16; $\alpha(\text{M})=0.000246$ 4; $\alpha(\text{N}+..)=6.49\times 10^{-5}$ 9 $\alpha(\text{N})=5.66\times 10^{-5}$ 8; $\alpha(\text{O})=7.96\times 10^{-6}$ 12; $\alpha(\text{P})=3.74\times 10^{-7}$ 6 $\alpha(\text{K})=0.00548$ 8; $\alpha(\text{L})=0.000900$ 13; $\alpha(\text{M})=0.000200$ 3; $\alpha(\text{N}+..)=5.27\times 10^{-5}$ 8 $\alpha(\text{N})=4.59\times 10^{-5}$ 7; $\alpha(\text{O})=6.49\times 10^{-6}$ 10; $\alpha(\text{P})=3.14\times 10^{-7}$ 5
1313.7	(2 ⁺)	700.0	100	613.83	2 ⁺	(E2)	0.00664	$\alpha(\text{K})=0.001236$ 18; $\alpha(\text{L})=0.0001728$ 25; $\alpha(\text{M})=3.77\times 10^{-5}$ 6; $\alpha(\text{N}+..)=6.67\times 10^{-5}$ 10 $\alpha(\text{N})=8.71\times 10^{-6}$ 13; $\alpha(\text{O})=1.269\times 10^{-6}$ 18; $\alpha(\text{P})=7.14\times 10^{-8}$ 10; $\alpha(\text{IPF})=5.66\times 10^{-5}$ 8 $\alpha(\text{K})=0.00369$ 6; $\alpha(\text{L})=0.000572$ 8; $\alpha(\text{M})=0.0001265$ 18; $\alpha(\text{N}+..)=3.35\times 10^{-5}$ 5 $\alpha(\text{N})=2.91\times 10^{-5}$ 4; $\alpha(\text{O})=4.16\times 10^{-6}$ 6; $\alpha(\text{P})=2.12\times 10^{-7}$ 3
1448.2	(2 ⁺)	1313.7 1448.2	43	0.0	0 ⁺	(E2)	1.51×10 ⁻³	$\alpha(\text{K})=0.001236$ 18; $\alpha(\text{L})=0.0001728$ 25; $\alpha(\text{M})=3.77\times 10^{-5}$ 6; $\alpha(\text{N}+..)=6.67\times 10^{-5}$ 10 $\alpha(\text{N})=8.71\times 10^{-6}$ 13; $\alpha(\text{O})=1.269\times 10^{-6}$ 18; $\alpha(\text{P})=7.14\times 10^{-8}$ 10; $\alpha(\text{IPF})=5.66\times 10^{-5}$ 8 $\alpha(\text{K})=0.00369$ 6; $\alpha(\text{L})=0.000572$ 8; $\alpha(\text{M})=0.0001265$ 18; $\alpha(\text{N}+..)=3.35\times 10^{-5}$ 5 $\alpha(\text{N})=2.91\times 10^{-5}$ 4; $\alpha(\text{O})=4.16\times 10^{-6}$ 6; $\alpha(\text{P})=2.12\times 10^{-7}$ 3
1452.8	1 ⁺ ,2 ⁺	839.1	100	613.83	2 ⁺	E2	0.00442	$\alpha(\text{K})=0.000423$ 6; $\alpha(\text{L})=5.51\times 10^{-5}$ 8; $\alpha(\text{M})=1.192\times 10^{-5}$ 17; $\alpha(\text{N}+..)=0.000351$ 5 $\alpha(\text{N})=2.75\times 10^{-6}$ 4; $\alpha(\text{O})=4.04\times 10^{-7}$ 6; $\alpha(\text{P})=2.38\times 10^{-8}$ 4; $\alpha(\text{IPF})=0.000347$ 5
1697.9	1 ⁻	1452.6 1697.9	32	0.0	0 ⁺	E1	8.41×10 ⁻⁴	$\alpha(\text{K})=0.000423$ 6; $\alpha(\text{L})=5.51\times 10^{-5}$ 8; $\alpha(\text{M})=1.192\times 10^{-5}$ 17; $\alpha(\text{N}+..)=0.000351$ 5 $\alpha(\text{N})=2.75\times 10^{-6}$ 4; $\alpha(\text{O})=4.04\times 10^{-7}$ 6; $\alpha(\text{P})=2.38\times 10^{-8}$ 4; $\alpha(\text{IPF})=0.000347$ 5
1750.71	4 ⁺	437.0 489.5	5 100	1313.7 1261.20	(2 ⁺) 4 ⁺	M1	0.0314	$\alpha(\text{K})=0.0266$ 4; $\alpha(\text{L})=0.00376$ 6; $\alpha(\text{M})=0.000824$ 12; $\alpha(\text{N}+..)=0.000220$ 4 $\alpha(\text{N})=0.000191$ 3; $\alpha(\text{O})=2.80\times 10^{-5}$ 4; $\alpha(\text{P})=1.624\times 10^{-6}$ 24
1781.90	5 ⁻	1136.8 520.66 8	41 100 16	613.83 1261.20	2 ⁺ 4 ⁺	E1	0.00469	$\alpha(\text{K})=0.00400$ 6; $\alpha(\text{L})=0.000548$ 8; $\alpha(\text{M})=0.0001192$ 17; $\alpha(\text{N}+..)=3.16\times 10^{-5}$ 5 $\alpha(\text{N})=2.74\times 10^{-5}$ 4; $\alpha(\text{O})=3.97\times 10^{-6}$ 6; $\alpha(\text{P})=2.18\times 10^{-7}$ 3 $\alpha(\text{K})=0.00947$ 14; $\alpha(\text{L})=0.001702$ 24; $\alpha(\text{M})=0.000382$ 6; $\alpha(\text{N}+..)=0.0001001$ 14 $\alpha(\text{N})=8.74\times 10^{-5}$ 13; $\alpha(\text{O})=1.216\times 10^{-5}$ 17; $\alpha(\text{P})=5.35\times 10^{-7}$ 8 $\alpha(\text{K})=0.000737$ 11; $\alpha(\text{L})=9.70\times 10^{-5}$ 14; $\alpha(\text{M})=2.10\times 10^{-5}$ 3; $\alpha(\text{N}+..)=4.05\times 10^{-5}$ 6 $\alpha(\text{N})=4.85\times 10^{-6}$ 7; $\alpha(\text{O})=7.10\times 10^{-7}$ 10; $\alpha(\text{P})=4.12\times 10^{-8}$ 6; $\alpha(\text{IPF})=3.49\times 10^{-5}$ 6
1840.6	1 ⁻ ,2 ⁻ ,3 ⁻	1226.8		613.83	2 ⁺	E1	8.95×10 ⁻⁴	B(E1)(W.u.)=8×10 ⁻⁵ +6-4 $\alpha(\text{K})=0.0708$ 11; $\alpha(\text{L})=0.01042$ 15; $\alpha(\text{M})=0.00228$ 4; $\alpha(\text{N}+..)=0.000597$ 9 $\alpha(\text{N})=0.000520$ 8; $\alpha(\text{O})=7.27\times 10^{-5}$ 11; $\alpha(\text{P})=3.49\times 10^{-6}$ 5
1944.60	6 ⁺	162.6 2	0.7 3	1781.90	5 ⁻	[E1]	0.0841	

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.#	$\alpha^\dagger$	$I_{(\gamma+ce)}$	Comments
1944.60	6 ⁺	683.47 8	100	1261.20	4 ⁺	E2	0.00702		$\alpha(\text{K})=0.00579$ 9; $\alpha(\text{L})=0.000958$ 14; $\alpha(\text{M})=0.000213$ 3; $\alpha(\text{N}+..)=5.62\times 10^{-5}$ 8 $\alpha(\text{N})=4.89\times 10^{-5}$ 7; $\alpha(\text{O})=6.91\times 10^{-6}$ 10; $\alpha(\text{P})=3.31\times 10^{-7}$ 5 B(E2)(W.u.)=16 +10-5
2071.02	6 ⁺	126.3 3	11 3	1944.60	6 ⁺	M1	1.230 20		$\alpha(\text{K})=1.035$ 16; $\alpha(\text{L})=0.1519$ 24; $\alpha(\text{M})=0.0334$ 6; $\alpha(\text{N}+..)=0.00891$ 14 $\alpha(\text{N})=0.00772$ 12; $\alpha(\text{O})=0.001129$ 18; $\alpha(\text{P})=6.45\times 10^{-5}$ 10 $\alpha(\text{K})=0.0401$ 6; $\alpha(\text{L})=0.00991$ 14; $\alpha(\text{M})=0.00228$ 4; $\alpha(\text{N}+..)=0.000588$ 9 $\alpha(\text{N})=0.000517$ 8; $\alpha(\text{O})=6.85\times 10^{-5}$ 10; $\alpha(\text{P})=2.12\times 10^{-6}$ 3 $\alpha(\text{K})=0.00398$ 6; $\alpha(\text{L})=0.000624$ 9; $\alpha(\text{M})=0.0001380$ 20; $\alpha(\text{N}+..)=3.65\times 10^{-5}$ 6 $\alpha(\text{N})=3.17\times 10^{-5}$ 5; $\alpha(\text{O})=4.53\times 10^{-6}$ 7; $\alpha(\text{P})=2.29\times 10^{-7}$ 4 $\alpha(\text{K})=0.206$ 3; $\alpha(\text{L})=0.0299$ 5; $\alpha(\text{M})=0.00656$ 10; $\alpha(\text{N}+..)=0.001753$ 25 $\alpha(\text{N})=0.001518$ 22; $\alpha(\text{O})=0.000222$ 4; $\alpha(\text{P})=1.276\times 10^{-5}$ 18 $\alpha(\text{K})=0.0624$ 9; $\alpha(\text{L})=0.00894$ 13; $\alpha(\text{M})=0.00196$ 3; $\alpha(\text{N}+..)=0.000523$ 8 $\alpha(\text{N})=0.000453$ 7; $\alpha(\text{O})=6.65\times 10^{-5}$ 10; $\alpha(\text{P})=3.84\times 10^{-6}$ 6 $\alpha(\text{K})=0.00736$ 11; $\alpha(\text{L})=0.001024$ 15; $\alpha(\text{M})=0.000223$ 4; $\alpha(\text{N}+..)=5.91\times 10^{-5}$ 9 $\alpha(\text{N})=5.13\times 10^{-5}$ 8; $\alpha(\text{O})=7.37\times 10^{-6}$ 11; $\alpha(\text{P})=3.96\times 10^{-7}$ 6 $\alpha(\text{K})=0.00920$ 13; $\alpha(\text{L})=0.001645$ 23; $\alpha(\text{M})=0.000369$ 6; $\alpha(\text{N}+..)=9.67\times 10^{-5}$ 14 $\alpha(\text{N})=8.45\times 10^{-5}$ 12; $\alpha(\text{O})=1.176\times 10^{-5}$ 17; $\alpha(\text{P})=5.20\times 10^{-7}$ 8 B(M1)(W.u.)=0.018 +8-5 $\alpha(\text{K})=0.761$ 11; $\alpha(\text{L})=0.1115$ 16; $\alpha(\text{M})=0.0245$ 4; $\alpha(\text{N}+..)=0.00654$ 10 $\alpha(\text{N})=0.00567$ 8; $\alpha(\text{O})=0.000829$ 12; $\alpha(\text{P})=4.74\times 10^{-5}$ 7 B(E2)(W.u.)=5.5 +25-15 $\alpha(\text{K})=0.0276$ 4; $\alpha(\text{L})=0.00622$ 9; $\alpha(\text{M})=0.001418$ 20; $\alpha(\text{N}+..)=0.000368$ 6 $\alpha(\text{N})=0.000323$ 5; $\alpha(\text{O})=4.33\times 10^{-5}$ 7; $\alpha(\text{P})=1.488\times 10^{-6}$ 21 B(E2)(W.u.)=37 +16-9 $\alpha(\text{K})=0.01265$ 18; $\alpha(\text{L})=0.00240$ 4; $\alpha(\text{M})=0.000541$ 8; $\alpha(\text{N}+..)=0.0001415$ 20 $\alpha(\text{N})=0.0001237$ 18; $\alpha(\text{O})=1.705\times 10^{-5}$ 24; $\alpha(\text{P})=7.07\times 10^{-7}$ 10 $\alpha(\text{K})=0.1323$ 19; $\alpha(\text{L})=0.0191$ 3; $\alpha(\text{M})=0.00419$ 6; $\alpha(\text{N}+..)=0.001120$ 16 $\alpha(\text{N})=0.000970$ 14; $\alpha(\text{O})=0.0001422$ 21; $\alpha(\text{P})=8.18\times 10^{-6}$ 12
2296.56	(7) ⁺	225.50 15	63 4	2071.02	6 ⁺	M1	0.244		
		352.2 3	100 6	1944.60	6 ⁺	(M1)	0.0738		
2342.63	7 ⁻	398.03 8	100 9	1944.60	6 ⁺	E1	0.00867		
		560.69 10	72 9	1781.90	5 ⁻	E2	0.01131		
2437.42	8 ⁺	140.8 1	2.5 3	2296.56	(7) ⁺	M1	0.904		
		366.3 2	3.4 4	2071.02	6 ⁺	E2	0.0356		
		492.85 6	100 5	1944.60	6 ⁺	E2	0.01573		
2703.09	8 ⁺	265.5 3	4.7 19	2437.42	8 ⁺	M1	0.1567		
		360.4 3	2.8 9	2342.63	7 ⁻				
		406.8 2	5.7 19	2296.56	(7) ⁺	(M1)	0.0506		$\alpha(\text{K})=0.0428$ 6; $\alpha(\text{L})=0.00610$ 9; $\alpha(\text{M})=0.001336$ 19; $\alpha(\text{N}+..)=0.000357$ 5 $\alpha(\text{N})=0.000309$ 5; $\alpha(\text{O})=4.54\times 10^{-5}$ 7; $\alpha(\text{P})=2.63\times 10^{-6}$ 4 $\alpha(\text{K})=0.00459$ 7; $\alpha(\text{L})=0.000733$ 11; $\alpha(\text{M})=0.0001626$ 23; $\alpha(\text{N}+..)=4.29\times 10^{-5}$ 6 $\alpha(\text{N})=3.74\times 10^{-5}$ 6; $\alpha(\text{O})=5.31\times 10^{-6}$ 8; $\alpha(\text{P})=2.63\times 10^{-7}$ 4 $\alpha(\text{K})=0.0497$ 8; $\alpha(\text{L})=0.00710$ 11; $\alpha(\text{M})=0.001555$ 23; $\alpha(\text{N}+..)=0.000416$
2726.7	(8) ⁻	384.1		2342.63	7 ⁻	M1	0.0588		

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	$I_\gamma^{\ddagger}$	E_f	J_f^π	Mult.#	$\alpha^\ddagger$	Comments
								6 $\alpha(\text{N})=0.000360$ 6; $\alpha(\text{O})=5.28\times 10^{-5}$ 8; $\alpha(\text{P})=3.05\times 10^{-6}$ 5
2906.05	9 ⁻	202.98 9 563.37 10	13 3 100 10	2703.09 8 ⁺ 2342.63 7 ⁻		E2	0.01118	$\alpha(\text{K})=0.00910$ 13; $\alpha(\text{L})=0.001623$ 23; $\alpha(\text{M})=0.000364$ 5; $\alpha(\text{N}+..)=9.54\times 10^{-5}$ 14
2930.1	(7) ⁻	859.1		2071.02 6 ⁺		E1	1.67×10^{-3}	$\alpha(\text{N})=8.33\times 10^{-5}$ 12; $\alpha(\text{O})=1.160\times 10^{-5}$ 17; $\alpha(\text{P})=5.14\times 10^{-7}$ 8 $\alpha(\text{K})=0.001423$ 20; $\alpha(\text{L})=0.000190$ 3; $\alpha(\text{M})=4.13\times 10^{-5}$ 6; $\alpha(\text{N}+..)=1.098\times 10^{-5}$ 16
3149.7	8 ⁻	853.1		2296.56 (7) ⁺		E1	1.69×10^{-3}	$\alpha(\text{N})=9.52\times 10^{-6}$ 14; $\alpha(\text{O})=1.388\times 10^{-6}$ 20; $\alpha(\text{P})=7.91\times 10^{-8}$ 12 $\alpha(\text{K})=0.001442$ 21; $\alpha(\text{L})=0.000193$ 3; $\alpha(\text{M})=4.18\times 10^{-5}$ 6; $\alpha(\text{N}+..)=1.114\times 10^{-5}$ 16
3160.63	(10) ⁻	254.5 2		2906.05 9 ⁻		[M1,E2]	0.14 4	$\alpha(\text{N})=9.65\times 10^{-6}$ 14; $\alpha(\text{O})=1.407\times 10^{-6}$ 20; $\alpha(\text{P})=8.02\times 10^{-8}$ 12 B(E2)(W.u.) ≤ 2.6 +7-5; B(M1)(W.u.) ≤ 0.00029 +8-6 $\alpha(\text{K})=0.11$ 4; $\alpha(\text{L})=0.0223$ 10; $\alpha(\text{M})=0.0050$ 4; $\alpha(\text{N}+..)=0.00132$ 7 $\alpha(\text{N})=0.00115$ 7; $\alpha(\text{O})=0.0001586$ 25; $\alpha(\text{P})=7.E-6$ 3 Mult.: See comment in Gd(α ,xny),(Hf,xny).
3172.8	(10) ⁻	266.8 3		2906.05 9 ⁻		(M1)	0.1547	$\alpha(\text{K})=0.1306$ 19; $\alpha(\text{L})=0.0189$ 3; $\alpha(\text{M})=0.00414$ 6; $\alpha(\text{N}+..)=0.001106$ 16
3173.37	10 ⁺	735.94 10		2437.42 8 ⁺		E2	0.00592	$\alpha(\text{N})=0.000957$ 14; $\alpha(\text{O})=0.0001403$ 21; $\alpha(\text{P})=8.07\times 10^{-6}$ 12 $\alpha(\text{K})=0.00490$ 7; $\alpha(\text{L})=0.000791$ 11; $\alpha(\text{M})=0.0001756$ 25; $\alpha(\text{N}+..)=4.64\times 10^{-5}$ 7
3183.69	10 ⁺	746.34 17	100 14	2437.42 8 ⁺		E2	0.00573	$\alpha(\text{N})=4.04\times 10^{-5}$ 6; $\alpha(\text{O})=5.72\times 10^{-6}$ 8; $\alpha(\text{P})=2.81\times 10^{-7}$ 4 $\alpha(\text{K})=0.00475$ 7; $\alpha(\text{L})=0.000764$ 11; $\alpha(\text{M})=0.0001694$ 24; $\alpha(\text{N}+..)=4.47\times 10^{-5}$ 7
3227.6	8 ⁻	931.0 3		2296.56 (7) ⁺		E1	1.43×10^{-3}	$\alpha(\text{N})=3.89\times 10^{-5}$ 6; $\alpha(\text{O})=5.53\times 10^{-6}$ 8; $\alpha(\text{P})=2.73\times 10^{-7}$ 4 $\alpha(\text{K})=0.001220$ 18; $\alpha(\text{L})=0.0001624$ 23; $\alpha(\text{M})=3.53\times 10^{-5}$ 5; $\alpha(\text{N}+..)=9.39\times 10^{-6}$ 14
3244.0	(9) ⁺	947.4 3		2296.56 (7) ⁺		E2	0.00341	$\alpha(\text{N})=8.13\times 10^{-6}$ 12; $\alpha(\text{O})=1.187\times 10^{-6}$ 17; $\alpha(\text{P})=6.80\times 10^{-8}$ 10 $\alpha(\text{K})=0.00286$ 4; $\alpha(\text{L})=0.000430$ 6; $\alpha(\text{M})=9.47\times 10^{-5}$ 14; $\alpha(\text{N}+..)=2.51\times 10^{-5}$ 4
3395.19	10 ⁺	692.1 1		2703.09 8 ⁺		E2@	0.00681	$\alpha(\text{N})=2.18\times 10^{-5}$ 3; $\alpha(\text{O})=3.13\times 10^{-6}$ 5; $\alpha(\text{P})=1.647\times 10^{-7}$ 23 $\alpha(\text{K})=0.00563$ 8; $\alpha(\text{L})=0.000927$ 13; $\alpha(\text{M})=0.000206$ 3; $\alpha(\text{N}+..)=5.43\times 10^{-5}$ 8
3487.1	(11) ⁻	581		2906.05 9 ⁻		(Q)		$\alpha(\text{N})=4.73\times 10^{-5}$ 7; $\alpha(\text{O})=6.69\times 10^{-6}$ 10; $\alpha(\text{P})=3.22\times 10^{-7}$ 5
3535.0	8 ⁻ ,9 ⁻	1097.6		2437.42 8 ⁺		E1	1.05×10^{-3}	Mult.: Probable $\Delta J=2$ transition. $\alpha(\text{K})=0.000899$ 13; $\alpha(\text{L})=0.0001189$ 17; $\alpha(\text{M})=2.58\times 10^{-5}$ 4; $\alpha(\text{N}+..)=6.87\times 10^{-6}$ 10
3820.20	12 ⁺	636.55 13	94 12	3183.69 10 ⁺		E2	0.00830	$\alpha(\text{N})=5.95\times 10^{-6}$ 9; $\alpha(\text{O})=8.70\times 10^{-7}$ 13; $\alpha(\text{P})=5.03\times 10^{-8}$ 7 $\alpha(\text{K})=0.00681$ 10; $\alpha(\text{L})=0.001157$ 17; $\alpha(\text{M})=0.000258$ 4; $\alpha(\text{N}+..)=6.79\times 10^{-5}$ 10
		646.8 2	100 18	3173.37 10 ⁺				$\alpha(\text{N})=5.92\times 10^{-5}$ 9; $\alpha(\text{O})=8.32\times 10^{-6}$ 12; $\alpha(\text{P})=3.88\times 10^{-7}$ 6

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^\ddagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult.#	$\alpha^\ddagger$	Comments
3820.20 3969.22	12 ⁺ (12 ⁻)	659.5 2 808.6 2	53 11	3160.63 3160.63	(10) ⁻ (10) ⁻	E2	0.00479	$\alpha(\text{K})=0.00399$ 6; $\alpha(\text{L})=0.000626$ 9; $\alpha(\text{M})=0.0001385$ 20; $\alpha(\text{N}+..)=3.66\times 10^{-5}$ 6 $\alpha(\text{N})=3.19\times 10^{-5}$ 5; $\alpha(\text{O})=4.54\times 10^{-6}$ 7; $\alpha(\text{P})=2.29\times 10^{-7}$ 4
3992.0 4015.8	(12 ⁻) 8 ⁺	831.3 1719.2		3160.63 2296.56	(10) ⁻ (7) ⁺	M1	1.66 $\times 10^{-3}$	$\alpha(\text{K})=0.001259$ 18; $\alpha(\text{L})=0.0001711$ 24; $\alpha(\text{M})=3.73\times 10^{-5}$ 6; $\alpha(\text{N}+..)=0.000196$ 3 $\alpha(\text{N})=8.62\times 10^{-6}$ 12; $\alpha(\text{O})=1.271\times 10^{-6}$ 18; $\alpha(\text{P})=7.52\times 10^{-8}$ 11; $\alpha(\text{IPF})=0.000186$ 3
4016.89 4125.6 4135.1 4430.20	12 ⁺ (13 ⁻) 14 ⁺	621.7 1 638.5 1 962.2 461.2 610.0 1	100	3395.19 3487.1 3172.8 3969.22 3820.20	10 ⁺ (11 ⁻) (10 ⁻) (12 ⁻) 12 ⁺	Q@ Q@ E2	0.00919	$\alpha(\text{K})=0.00753$ 11; $\alpha(\text{L})=0.001299$ 19; $\alpha(\text{M})=0.000290$ 4; $\alpha(\text{N}+..)=7.63\times 10^{-5}$ 11 $\alpha(\text{N})=6.66\times 10^{-5}$ 10; $\alpha(\text{O})=9.32\times 10^{-6}$ 13; $\alpha(\text{P})=4.28\times 10^{-7}$ 6 Mult.: DCO suggest $\Delta J=2$ or 0.
4495.0 4650.49 4659.0 4734.5	(12 ⁻) 14 ⁺ (14 ⁻) (13 ⁺ ,14 ⁻)	526 633.6 1 690 742.4 765.2 3		3969.22 4016.89 3969.22 3992.0 3969.22	(12 ⁻) 12 ⁺ (12 ⁻) (12 ⁻) (12 ⁻)	Q@		
4804.87	13 ⁺ ,14 ⁺	374.4 984.7 2		4430.20 3820.20	14 ⁺ 12 ⁺			
4817.7 5034.79	(15 ⁻) 15 ⁺	692.1 1 229.9 3 300.2 2 604.6 1		4125.6 4804.87 4734.5 4430.20	(13 ⁻) 13 ⁺ ,14 ⁺ (13 ⁺ ,14 ⁻) 14 ⁺	Q@ M1	0.0183	$\alpha(\text{K})=0.01555$ 22; $\alpha(\text{L})=0.00219$ 3; $\alpha(\text{M})=0.000478$ 7; $\alpha(\text{N}+..)=0.0001279$ 18 $\alpha(\text{N})=0.0001107$ 16; $\alpha(\text{O})=1.627\times 10^{-5}$ 23; $\alpha(\text{P})=9.47\times 10^{-7}$ 14 $\alpha(\text{L})=24.1$ 6; $\alpha(\text{M})=5.78$ 14; $\alpha(\text{N}+..)=1.44$ 4 $\alpha(\text{N})=1.29$ 3; $\alpha(\text{O})=0.152$ 4; $\alpha(\text{P})=0.000177$ 3 B(E2)(W.u.)=14.1 11
5088.1	17 ⁺	53.3 2		5034.79	15 ⁺	E2	31.3 8	
5177.7	(14 ⁻)	519 683		4659.0 4495.0	(14 ⁻) (12 ⁻)	Q@		
5215.59 5341.7	16 ⁺ 18 ⁺	565.1 1 253.6 1		4650.49 5088.1	14 ⁺ 17 ⁺	M1	0.1774	$\alpha(\text{K})=0.1497$ 21; $\alpha(\text{L})=0.0217$ 3; $\alpha(\text{M})=0.00475$ 7; $\alpha(\text{N}+..)=0.001270$ 18 $\alpha(\text{N})=0.001099$ 16; $\alpha(\text{O})=0.0001611$ 23; $\alpha(\text{P})=9.26\times 10^{-6}$ 13
5531.7 5762.20 5867.0	(17 ⁻) 18 ⁺ 19 ⁻	714.0 1 546.6 1 525.3 2		4817.7 5215.59 5341.7	(15 ⁻) 16 ⁺ 18 ⁺	Q@ Q@ E1	0.00460	$\alpha(\text{K})=0.00392$ 6; $\alpha(\text{L})=0.000537$ 8; $\alpha(\text{M})=0.0001169$ 17;

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)							
$E_i(\text{level})$	J_i^π	$E_\gamma^\ddagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. #	$\alpha^\ddagger$
Comments							
$\alpha(\text{N}+..)=3.10\times 10^{-5}$ 5 $\alpha(\text{N})=2.69\times 10^{-5}$ 4; $\alpha(\text{O})=3.89\times 10^{-6}$ 6; $\alpha(\text{P})=2.14\times 10^{-7}$ 3							
5884.3	(16 ⁻)	706.6 1		5177.7	(14 ⁻)	Q@	
6051.6	(20 ⁺)	709.9 5		5341.7	18 ⁺	Q@	
6111.4	(20 ⁺)	769.65 21		5341.7	18 ⁺	Q@	
6129.4	21 ⁻	262.45 6		5867.0	19 ⁻	E2	0.0978
B(E2)(W.u.)=0.90 +8-6 $\alpha(\text{K})=0.0711$ 10; $\alpha(\text{L})=0.0206$ 3; $\alpha(\text{M})=0.00478$ 7; $\alpha(\text{N}+..)=0.001227$ 18 $\alpha(\text{N})=0.001083$ 16; $\alpha(\text{O})=0.0001405$ 20; $\alpha(\text{P})=3.61\times 10^{-6}$ 5							
6171.8		304.8 2		5867.0	19 ⁻	D&	
6225.4	(20)	358.4 3		5867.0	19 ⁻	D&	
6258.5	(19 ⁻)	726.8 1		5531.7	(17 ⁻)	Q@	
6370.3	20 ⁺	608.1 1		5762.20	18 ⁺	Q@	
6536.0		669		5867.0	19 ⁻		
6625.1	(18 ⁻)	740.8 1		5884.3	(16 ⁻)	Q@	
6737.0	(22 ⁺)	609.0 ^a 10	≈36	6129.4	21 ⁻		
E _γ : From 1987St15 but not confirmed by 1989Zu01 even though the 625γ is 3 to 4 times stronger than in the work of 1987St15.							
		625.5 3	100	6111.4	(20 ⁺)	Q@	
7024.5	(21 ⁻)	766.0 1		6258.5	(19 ⁻)	Q@	
7050.6	22 ⁺	680.3 1		6370.3	20 ⁺	E2	0.00709
$\alpha(\text{K})=0.00585$ 9; $\alpha(\text{L})=0.000969$ 14; $\alpha(\text{M})=0.000216$ 3; $\alpha(\text{N}+..)=5.68\times 10^{-5}$ 8 $\alpha(\text{N})=4.95\times 10^{-5}$ 7; $\alpha(\text{O})=6.99\times 10^{-6}$ 10; $\alpha(\text{P})=3.34\times 10^{-7}$ 5 B(E2)(W.u.)=128 +14-11 Mult.: ΔJ=2. RUL rules out M2.							
7120.1	23 ⁻	382		6737.0	(22 ⁺)		
		990.7 2		6129.4	21 ⁻	E2	0.00310
$\alpha(\text{K})=0.00261$ 4; $\alpha(\text{L})=0.000388$ 6; $\alpha(\text{M})=8.55\times 10^{-5}$ 12; $\alpha(\text{N}+..)=2.27\times 10^{-5}$ 4 $\alpha(\text{N})=1.97\times 10^{-5}$ 3; $\alpha(\text{O})=2.83\times 10^{-6}$ 4; $\alpha(\text{P})=1.504\times 10^{-7}$ 21							
7227.0	(24 ⁺)	490.0 10		6737.0	(22 ⁺)	Q@	
7413.5	(20 ⁻)	788.4 1	100 8	6625.1	(18 ⁻)	Q@	
		1546	33 8	5867.0	19 ⁻		
7661.3	25 ⁻	541.2 2		7120.1	23 ⁻	E2	0.01237
$\alpha(\text{K})=0.01003$ 14; $\alpha(\text{L})=0.00182$ 3; $\alpha(\text{M})=0.000409$ 6; $\alpha(\text{N}+..)=0.0001072$ 15 $\alpha(\text{N})=9.36\times 10^{-5}$ 14; $\alpha(\text{O})=1.300\times 10^{-5}$ 19; $\alpha(\text{P})=5.65\times 10^{-7}$ 8							
7710.0	(24 ⁺)	483	36 18	7227.0	(24 ⁺)		
		973	100 36	6737.0	(22 ⁺)		
7803.9	24 ⁺	753.3 1		7050.6	22 ⁺	E2	0.00561
$\alpha(\text{K})=0.00466$ 7; $\alpha(\text{L})=0.000746$ 11; $\alpha(\text{M})=0.0001654$ 24; $\alpha(\text{N}+..)=4.37\times 10^{-5}$ 7 $\alpha(\text{N})=3.80\times 10^{-5}$ 6; $\alpha(\text{O})=5.40\times 10^{-6}$ 8; $\alpha(\text{P})=2.67\times 10^{-7}$ 4 B(E2)(W.u.)=76 +7-6 Mult.: ΔJ=2. RUL rules out M2.							
7848.6	(23 ⁻)	824.1 1		7024.5	(21 ⁻)	Q@	
7881.9	27 ⁻	220.6 2		7661.3	25 ⁻	E2	0.1709
B(E2)(W.u.)=12.0 +17-13 $\alpha(\text{K})=0.1186$ 17; $\alpha(\text{L})=0.0405$ 6; $\alpha(\text{M})=0.00944$ 14; $\alpha(\text{N}+..)=0.00241$ 4 $\alpha(\text{N})=0.00214$ 3; $\alpha(\text{O})=0.000273$ 4; $\alpha(\text{P})=5.79\times 10^{-6}$ 9							

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	$I_\gamma^{\ddagger}$	E_f	J_f^π	Mult. #	$\alpha^\dagger$	Comments
8185.9		304		7881.9	27 ⁻			
8238.7	(22 ⁻)	825.2 2		7413.5	(20 ⁻)	Q [@]		
8337.9		456		7881.9	27 ⁻			
8628.8	26 ⁺	824.9 1		7803.9	24 ⁺	E2	0.00459	$\alpha(\text{K})=0.00382$ 6; $\alpha(\text{L})=0.000596$ 9; $\alpha(\text{M})=0.0001318$ 19; $\alpha(\text{N}+..)=3.49\times 10^{-5}$ 5 $\alpha(\text{N})=3.03\times 10^{-5}$ 5; $\alpha(\text{O})=4.33\times 10^{-6}$ 6; $\alpha(\text{P})=2.20\times 10^{-7}$ 3 B(E2)(W.u.)=178 +16-13 Mult.: $\Delta J=2$. RUL rules out M2.
8735.9	(25 ⁻)	887.3 1		7848.6	(23 ⁻)	Q [@]		
8848.8	28 ⁺	966.9 2		7881.9	27 ⁻	E1	1.33×10^{-3}	B(E1)(W.u.)= 1.1×10^{-5} +6-3 $\alpha(\text{K})=0.001136$ 16; $\alpha(\text{L})=0.0001510$ 22; $\alpha(\text{M})=3.28\times 10^{-5}$ 5; $\alpha(\text{N}+..)=8.73\times 10^{-6}$ 13 $\alpha(\text{N})=7.56\times 10^{-6}$ 11; $\alpha(\text{O})=1.104\times 10^{-6}$ 16; $\alpha(\text{P})=6.34\times 10^{-8}$ 9 B(M1)(W.u.)=0.11 +4-3 $\alpha(\text{K})=0.669$ 10; $\alpha(\text{L})=0.0980$ 14; $\alpha(\text{M})=0.0215$ 3; $\alpha(\text{N}+..)=0.00575$ 9 $\alpha(\text{N})=0.00498$ 7; $\alpha(\text{O})=0.000728$ 11; $\alpha(\text{P})=4.16\times 10^{-5}$ 6
8996.2	29 ⁺	147.4 1		8848.8	28 ⁺	M1	0.794	B(M1)(W.u.)=0.046 +8-6 $\alpha(\text{K})=0.0440$ 7; $\alpha(\text{L})=0.00628$ 9; $\alpha(\text{M})=0.001376$ 20; $\alpha(\text{N}+..)=0.000368$ 6 $\alpha(\text{N})=0.000318$ 5; $\alpha(\text{O})=4.67\times 10^{-5}$ 7; $\alpha(\text{P})=2.70\times 10^{-6}$ 4 $\alpha(\text{K})=0.00322$ 5; $\alpha(\text{L})=0.000492$ 7; $\alpha(\text{M})=0.0001085$ 16; $\alpha(\text{N}+..)=2.87\times 10^{-5}$ 4 $\alpha(\text{N})=2.50\times 10^{-5}$ 4; $\alpha(\text{O})=3.58\times 10^{-6}$ 5; $\alpha(\text{P})=1.86\times 10^{-7}$ 3 B(E2)(W.u.)=122 11 Mult.: $\Delta J=2$. RUL rules out M2.
9117.5	(24 ⁻)	878.8 1		8238.7	(22 ⁻)	Q [@]		
9398.6	30 ⁺	402.3 2		8996.2	29 ⁺	M1	0.0521	B(M1)(W.u.)=0.046 +8-6 $\alpha(\text{K})=0.0440$ 7; $\alpha(\text{L})=0.00628$ 9; $\alpha(\text{M})=0.001376$ 20; $\alpha(\text{N}+..)=0.000368$ 6 $\alpha(\text{N})=0.000318$ 5; $\alpha(\text{O})=4.67\times 10^{-5}$ 7; $\alpha(\text{P})=2.70\times 10^{-6}$ 4 $\alpha(\text{K})=0.00322$ 5; $\alpha(\text{L})=0.000492$ 7; $\alpha(\text{M})=0.0001085$ 16; $\alpha(\text{N}+..)=2.87\times 10^{-5}$ 4 $\alpha(\text{N})=2.50\times 10^{-5}$ 4; $\alpha(\text{O})=3.58\times 10^{-6}$ 5; $\alpha(\text{P})=1.86\times 10^{-7}$ 3 B(E2)(W.u.)=122 11 Mult.: $\Delta J=2$. RUL rules out M2.
9523.0	28 ⁺	894.2 1		8628.8	26 ⁺	E2	0.00385	$\alpha(\text{K})=0.00322$ 5; $\alpha(\text{L})=0.000492$ 7; $\alpha(\text{M})=0.0001085$ 16; $\alpha(\text{N}+..)=2.87\times 10^{-5}$ 4 $\alpha(\text{N})=2.50\times 10^{-5}$ 4; $\alpha(\text{O})=3.58\times 10^{-6}$ 5; $\alpha(\text{P})=1.86\times 10^{-7}$ 3 B(E2)(W.u.)=122 11 Mult.: $\Delta J=2$. RUL rules out M2.
9687.9	(27 ⁻)	952.0 1		8735.9	(25 ⁻)	Q [@]		
10012.3		613		9398.6	30 ⁺			
		1016		8996.2	29 ⁺			
10048.5	(26 ⁻)	931.0 1		9117.5	(24 ⁻)	Q [@]		
10110.2	31 ⁺	97		10012.3				
		711.5 3	72 14	9398.6	30 ⁺	M1	0.01221	$\alpha(\text{K})=0.01036$ 15; $\alpha(\text{L})=0.001450$ 21; $\alpha(\text{M})=0.000317$ 5; $\alpha(\text{N}+..)=8.47\times 10^{-5}$ 12 $\alpha(\text{N})=7.33\times 10^{-5}$ 11; $\alpha(\text{O})=1.078\times 10^{-5}$ 16; $\alpha(\text{P})=6.29\times 10^{-7}$ 9 $\alpha(\text{K})=0.00206$ 3; $\alpha(\text{L})=0.000299$ 5; $\alpha(\text{M})=6.57\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.79\times 10^{-5}$ 3 $\alpha(\text{N})=1.514\times 10^{-5}$ 22; $\alpha(\text{O})=2.19\times 10^{-6}$ 3; $\alpha(\text{P})=1.188\times 10^{-7}$ 17; $\alpha(\text{IPF})=4.76\times 10^{-7}$ 9
		1114.2 3	100 15	8996.2	29 ⁺	E2	0.00244	$\alpha(\text{K})=0.00206$ 3; $\alpha(\text{L})=0.000299$ 5; $\alpha(\text{M})=6.57\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.79\times 10^{-5}$ 3 $\alpha(\text{N})=1.514\times 10^{-5}$ 22; $\alpha(\text{O})=2.19\times 10^{-6}$ 3; $\alpha(\text{P})=1.188\times 10^{-7}$ 17; $\alpha(\text{IPF})=4.76\times 10^{-7}$ 9
10257.2		858		9398.6	30 ⁺			
10484.3	30 ⁺	961.3 1		9523.0	28 ⁺	E2	0.00330	$\alpha(\text{K})=0.00277$ 4; $\alpha(\text{L})=0.000416$ 6; $\alpha(\text{M})=9.16\times 10^{-5}$ 13; $\alpha(\text{N}+..)=2.43\times 10^{-5}$ 4 $\alpha(\text{N})=2.11\times 10^{-5}$ 3; $\alpha(\text{O})=3.03\times 10^{-6}$ 5; $\alpha(\text{P})=1.599\times 10^{-7}$ 23 B(E2)(W.u.)=127 8 Mult.: $\Delta J=2$. RUL rules out M2.

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	$I_\gamma^{\ddagger}$	E_f	J_f^π	Mult.#	$\alpha^\ddagger$	Comments
10541.1	(32 ⁺)	431.0 3		10110.2	31 ⁺	(M1)	0.0435	$\alpha(\text{K})=0.0368$ 6; $\alpha(\text{L})=0.00524$ 8; $\alpha(\text{M})=0.001148$ 17; $\alpha(\text{N}+..)=0.000307$ 5 $\alpha(\text{N})=0.000266$ 4; $\alpha(\text{O})=3.90\times 10^{-5}$ 6; $\alpha(\text{P})=2.26\times 10^{-6}$ 4 B(M1)(W.u.) ≤ 0.048
		1142		9398.6	30 ⁺	[E2]	0.00232	B(E2)(W.u.) ≤ 1.1 $\alpha(\text{K})=0.00196$ 3; $\alpha(\text{L})=0.000284$ 4; $\alpha(\text{M})=6.22\times 10^{-5}$ 9; $\alpha(\text{N}+..)=1.777\times 10^{-5}$ 25 $\alpha(\text{N})=1.435\times 10^{-5}$ 20; $\alpha(\text{O})=2.08\times 10^{-6}$ 3; $\alpha(\text{P})=1.131\times 10^{-7}$ 16; $\alpha(\text{IPF})=1.235\times 10^{-6}$ 18
10705.3	(29 ⁻)	1017.4 1		9687.9	(27 ⁻)	Q [@]		
10795.1	(33 ⁺)	254.2 3	100 10	10541.1	(32 ⁺)	[M1,E2]	0.14 4	$\alpha(\text{K})=0.11$ 4; $\alpha(\text{L})=0.0224$ 10; $\alpha(\text{M})=0.0051$ 4; $\alpha(\text{N}+..)=0.00132$ 7 $\alpha(\text{N})=0.00116$ 7; $\alpha(\text{O})=0.0001592$ 25; $\alpha(\text{P})=7.\text{E}-6$ 3 B(M1)(W.u.) ≤ 0.11 ; B(E2)(W.u.) ≤ 680
		684.9 3	34 7	10110.2	31 ⁺	E2	0.00698	$\alpha(\text{K})=0.00576$ 8; $\alpha(\text{L})=0.000952$ 14; $\alpha(\text{M})=0.000212$ 3; $\alpha(\text{N}+..)=5.58\times 10^{-5}$ 8 $\alpha(\text{N})=4.86\times 10^{-5}$ 7; $\alpha(\text{O})=6.87\times 10^{-6}$ 10; $\alpha(\text{P})=3.29\times 10^{-7}$ 5 B(E2)(W.u.)=1.3 +7-4
10961.0		703		10257.2				
		851		10110.2	31 ⁺			
11032.7	(28 ⁻)	984.2 1		10048.5	(26 ⁻)	Q [@]		
11209.0		248		10961.0				
		668		10541.1	(32 ⁺)			
		952		10257.2				
11245.4	(26 ⁺)	602.4 1	100	10643.0	(24 ⁺)			
		3364 4	≈ 1.5	7881.9	27 ⁻			
		3585 4	≈ 2.3	7661.3	25 ⁻			
11395.4		600		10795.1	(33 ⁺)			
11442.9		901		10541.1	(32 ⁺)			
11511.9	32 ⁺	1027.6 1		10484.3	30 ⁺	E2	0.00288	$\alpha(\text{K})=0.00242$ 4; $\alpha(\text{L})=0.000358$ 5; $\alpha(\text{M})=7.86\times 10^{-5}$ 11; $\alpha(\text{N}+..)=2.09\times 10^{-5}$ 3 $\alpha(\text{N})=1.81\times 10^{-5}$ 3; $\alpha(\text{O})=2.61\times 10^{-6}$ 4; $\alpha(\text{P})=1.396\times 10^{-7}$ 20 B(E2)(W.u.)=162 +21-17 Mult.: $\Delta J=2$. RUL rules out M2.
11574.6	(34 ⁻)	131		11442.9				
		613		10961.0				
		779.6 3		10795.1	(33 ⁺)	E1	0.00201	$\alpha(\text{K})=0.001720$ 25; $\alpha(\text{L})=0.000231$ 4; $\alpha(\text{M})=5.02\times 10^{-5}$ 7; $\alpha(\text{N}+..)=1.334\times 10^{-5}$ 19 $\alpha(\text{N})=1.156\times 10^{-5}$ 17; $\alpha(\text{O})=1.683\times 10^{-6}$ 24; $\alpha(\text{P})=9.54\times 10^{-8}$ 14
11602.1		1061		10541.1	(32 ⁺)			
		1345		10257.2				
11788.7	(31 ⁻)	1083.4 1		10705.3	(29 ⁻)	Q [@]		
11793.0		191		11602.1				
11859.0		257		11602.1				
		1064		10795.1	(33 ⁺)			
11892.9	(28 ⁺)	647.5 1	100 14	11245.4	(26 ⁺)			

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	$I_\gamma^{\ddagger}$	E_f	J_f^π	Mult.#	$\alpha^\ddagger$	Comments
11892.9	(28 ⁺)	2713 ^a 4 2895 4 3044 ^a 4 4011 2	≈ 0.8 ≈ 0.8 2.2 5	9180? 8996.2 8848.8 7881.9	(26 ⁺ to 30 ⁺) 29 ⁺ 28 ⁺ 27 ⁻			I_γ : intensity is same or higher than that of the 4011 γ .
11963.2	(35 ⁻)	388.6 3		11574.6	(34 ⁻)	D M1	0.0570	I_γ : from $I_\gamma(4011)/I_\gamma(647)=0.9/40$. $\alpha(\text{K})=0.0482$ 7; $\alpha(\text{L})=0.00688$ 10; $\alpha(\text{M})=0.001508$ 22; $\alpha(\text{N}+..)=0.000403$ 6 $\alpha(\text{N})=0.000349$ 5; $\alpha(\text{O})=5.12\times 10^{-5}$ 8; $\alpha(\text{P})=2.96\times 10^{-6}$ 5 $\text{B}(\text{M1})(\text{W.u.})\leq 0.45$
12071.9	(30 ⁻)	520 1039.2 1		11442.9 11032.7	(28 ⁻)	Q@		
12178.9		320 386 970		11859.0 11793.0 11209.0				
12325.1	(36 ⁻)	362 750		11963.2 11574.6	(35 ⁻) (34 ⁻)			
12428.7		248 ^a 854 1033 1220		12178.9 11574.6 11395.4 11209.0	(34 ⁻)			
12585.6	(30 ⁺)	692.7 1		11892.9	(28 ⁺)	[E2]	0.00680	$\alpha(\text{K})=0.00562$ 8; $\alpha(\text{L})=0.000925$ 13; $\alpha(\text{M})=0.000206$ 3; $\alpha(\text{N}+..)=5.42\times 10^{-5}$ 8 $\alpha(\text{N})=4.72\times 10^{-5}$ 7; $\alpha(\text{O})=6.67\times 10^{-6}$ 10; $\alpha(\text{P})=3.21\times 10^{-7}$ 5 $\text{B}(\text{E2})(\text{W.u.})=2440$
12604.3	34 ⁺	1092.4 1		11511.9	32 ⁺	E2	0.00254	$\alpha(\text{K})=0.00214$ 3; $\alpha(\text{L})=0.000313$ 5; $\alpha(\text{M})=6.86\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.82\times 10^{-5}$ 3 $\alpha(\text{N})=1.581\times 10^{-5}$ 23; $\alpha(\text{O})=2.28\times 10^{-6}$ 4; $\alpha(\text{P})=1.235\times 10^{-7}$ 18 $\text{B}(\text{E2})(\text{W.u.})=134 +19-15$ Mult.: $\Delta J=2$. RUL rules out M2.
12716.9		288 538 754		12428.7 12178.9 11963.2	(35 ⁻)			
12938.2	(33 ⁻)	1149.5 1		11788.7	(31 ⁻)	Q@		
12946.2		518 ^a 983		12428.7 11963.2	(35 ⁻)			
13048.9		1086		11963.2	(35 ⁻)			
13117.1		792		12325.1	(36 ⁻)			
13169.0	(32 ⁻)	1097.1 1		12071.9	(30 ⁻)	Q@		
13253.4		1858		11395.4				
13323.7	(32 ⁺)	738.1 1		12585.6	(30 ⁺)	[E2]	0.00588	$\alpha(\text{K})=0.00487$ 7; $\alpha(\text{L})=0.000786$ 11; $\alpha(\text{M})=0.0001743$ 25; $\alpha(\text{N}+..)=4.60\times 10^{-5}$ 7 $\alpha(\text{N})=4.00\times 10^{-5}$ 6; $\alpha(\text{O})=5.68\times 10^{-6}$ 8; $\alpha(\text{P})=2.79\times 10^{-7}$ 4 $\text{B}(\text{E2})(\text{W.u.})=2420$
13396.7		348 1071		13048.9 12325.1	(36 ⁻)			

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	E_f	J_f^π	Mult. [#]	$\alpha^{\ddagger}$	$I_{(\gamma+ce)}$	Comments
13396.7		1218	12178.9					
13493.1		1168	12325.1	(36 ⁻)				
13517.1		1192	12325.1	(36 ⁻)				
13687.1		1362	12325.1	(36 ⁻)				
13721.9		1005	12716.9					
13762.7	36 ⁺	1158.4 <i>I</i>	12604.3	34 ⁺	E2	0.00226		$\alpha(\text{K})=0.00190$ 3; $\alpha(\text{L})=0.000275$ 4; $\alpha(\text{M})=6.03\times 10^{-5}$ 9; $\alpha(\text{N}+..)=1.80\times 10^{-5}$ 3 $\alpha(\text{N})=1.391\times 10^{-5}$ 20; $\alpha(\text{O})=2.01\times 10^{-6}$ 3; $\alpha(\text{P})=1.100\times 10^{-7}$ 16; $\alpha(\text{IPF})=2.00\times 10^{-6}$ 3 B(E2)(W.u.)=160 +40-27 Mult.: $\Delta J=2$. RUL rules out M2.
14107.7	(34 ⁺)	784.0 <i>I</i>	13323.7	(32 ⁺)	[E2]	0.00513		$\alpha(\text{K})=0.00427$ 6; $\alpha(\text{L})=0.000675$ 10; $\alpha(\text{M})=0.0001495$ 21; $\alpha(\text{N}+..)=3.95\times 10^{-5}$ 6 $\alpha(\text{N})=3.44\times 10^{-5}$ 5; $\alpha(\text{O})=4.89\times 10^{-6}$ 7; $\alpha(\text{P})=2.45\times 10^{-7}$ 4 B(E2)(W.u.)=2470
14154.1	(35 ⁻)	1215.9 <i>I</i>	12938.2	(33 ⁻)	Q [@]			
14237.4	(31 ⁻)	1645 ^a	12585.6	(30 ⁺)				
14325.3	(34 ⁻)	1156.3 <i>I</i>	13169.0	(32 ⁻)	Q [@]			
14484.9		763	13721.9					
14663.2		976	13687.1					
14741.9		1020	13721.9					
14937.6	(36 ⁺)	829.9 <i>I</i>	14107.7	(34 ⁺)	[E2]	0.00453		$\alpha(\text{K})=0.00377$ 6; $\alpha(\text{L})=0.000588$ 9; $\alpha(\text{M})=0.0001299$ 19; $\alpha(\text{N}+..)=3.44\times 10^{-5}$ 5 $\alpha(\text{N})=2.99\times 10^{-5}$ 5; $\alpha(\text{O})=4.27\times 10^{-6}$ 6; $\alpha(\text{P})=2.17\times 10^{-7}$ 3 B(E2)(W.u.)=2470
14984.0	38 ⁺	1221.3 <i>I</i>	13762.7	36 ⁺	E2	0.00204		$\alpha(\text{K})=0.001716$ 24; $\alpha(\text{L})=0.000246$ 4; $\alpha(\text{M})=5.38\times 10^{-5}$ 8; $\alpha(\text{N}+..)=2.21\times 10^{-5}$ 3 $\alpha(\text{N})=1.242\times 10^{-5}$ 18; $\alpha(\text{O})=1.80\times 10^{-6}$ 3; $\alpha(\text{P})=9.91\times 10^{-8}$ 14; $\alpha(\text{IPF})=7.74\times 10^{-6}$ 11 B(E2)(W.u.)=56 6 Mult.: $\Delta J=2$. RUL rules out M2.
14998.9	(33 ⁻)	761.5 2	14237.4	(31 ⁻)			100 30	
		1676	13323.7	(32 ⁺)			22 8	
15435.6	(37 ⁻)	1281.5 <i>I</i>	14154.1	(35 ⁻)	Q [@]			
15543.0	(36 ⁻)	1217.7 <i>I</i>	14325.3	(34 ⁻)	Q [@]			
15803.4	(35 ⁻)	804.5 2	14998.9	(33 ⁻)			100 12	
		1696	14107.7	(34 ⁺)			12 4	
15814.1	(38 ⁺)	876.4 <i>I</i>	14937.6	(36 ⁺)	[E2]	0.00402		$\alpha(\text{K})=0.00336$ 5; $\alpha(\text{L})=0.000516$ 8; $\alpha(\text{M})=0.0001138$ 16; $\alpha(\text{N}+..)=3.01\times 10^{-5}$ 5 $\alpha(\text{N})=2.62\times 10^{-5}$ 4; $\alpha(\text{O})=3.75\times 10^{-6}$ 6; $\alpha(\text{P})=1.94\times 10^{-7}$ 3 B(E2)(W.u.)=2430
16267.0	40 ⁺	1283.0 <i>I</i>	14984.0	38 ⁺	E2	0.00186		$\alpha(\text{K})=0.001559$ 22; $\alpha(\text{L})=0.000222$ 4; $\alpha(\text{M})=4.85\times 10^{-5}$ 7; $\alpha(\text{N}+..)=2.95\times 10^{-5}$ 5 $\alpha(\text{N})=1.119\times 10^{-5}$ 16; $\alpha(\text{O})=1.625\times 10^{-6}$ 23; $\alpha(\text{P})=9.01\times 10^{-8}$ 13; $\alpha(\text{IPF})=1.660\times 10^{-5}$ 24 B(E2)(W.u.)=54 +15-10 Mult.: $\Delta J=2$. RUL rules out M2.
16397.0		1912	14484.9					
16653.0	(37 ⁻)	849.7 2	15803.4	(35 ⁻)			100 11	
		1715	14937.6	(36 ⁺)			11 3	

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)

<u>E_i(level)</u>	<u>J^{π}_i</u>	<u>E_{γ}^{$\dagger$}</u>	<u>E_f</u>	<u>J^{π}_f</u>	<u>Mult. #</u>	<u>$\alpha^{\dagger}$</u>	<u>I_($\gamma+ce$)</u>	<u>Comments</u>
16737.3	(40 ⁺)	923.2 1	15814.1	(38 ⁺)	[E2]	0.00360		$\alpha(\text{K})=0.00301$ 5; $\alpha(\text{L})=0.000457$ 7; $\alpha(\text{M})=0.0001006$ 14; $\alpha(\text{N}+..)=2.67\times 10^{-5}$ 4 $\alpha(\text{N})=2.32\times 10^{-5}$ 4; $\alpha(\text{O})=3.33\times 10^{-6}$ 5; $\alpha(\text{P})=1.738\times 10^{-7}$ 25 B(E2)(W.u.)=2460
16778.9	(39 ⁻)	1343.3 1	15435.6	(37 ⁻)	Q@		100 11 8 3	
16824.4	(38 ⁻)	1281.4 1	15543.0	(36 ⁻)				
17539.0		1142	16397.0					
17547.9	(39 ⁻)	894.9 2	16653.0	(37 ⁻)				
		1734	15814.1	(38 ⁺)				
17608.6	(42 ⁺)	1341.6 1	16267.0	40 ⁺	[E2]	1.72×10 ⁻³		$\alpha(\text{K})=0.001430$ 20; $\alpha(\text{L})=0.000202$ 3; $\alpha(\text{M})=4.42\times 10^{-5}$ 7; $\alpha(\text{N}+..)=3.97\times 10^{-5}$ 6 $\alpha(\text{N})=1.019\times 10^{-5}$ 15; $\alpha(\text{O})=1.482\times 10^{-6}$ 21; $\alpha(\text{P})=8.26\times 10^{-8}$ 12; $\alpha(\text{IPF})=2.79\times 10^{-5}$ 4 B(E2)(W.u.)>128
17707.5	(42 ⁺)	970.2 1	16737.3	(40 ⁺)	[E2]	0.00324		$\alpha(\text{K})=0.00272$ 4; $\alpha(\text{L})=0.000407$ 6; $\alpha(\text{M})=8.97\times 10^{-5}$ 13; $\alpha(\text{N}+..)=2.38\times 10^{-5}$ 4 $\alpha(\text{N})=2.07\times 10^{-5}$ 3; $\alpha(\text{O})=2.97\times 10^{-6}$ 5; $\alpha(\text{P})=1.569\times 10^{-7}$ 22 B(E2)(W.u.)=2480
18172.1	(40 ⁻)	1347.6 2	16824.4	(38 ⁻)	[E2]	0.00294	100 5 8 3	
18179.2	(41 ⁻)	1400.3 2	16778.9	(39 ⁻)				
18489.0	(41 ⁻)	941.2 2	17547.9	(39 ⁻)				
		1751	16737.3	(40 ⁺)				
18724.9	(44 ⁺)	1017.4 1	17707.5	(42 ⁺)	[E2]	0.00294		$\alpha(\text{K})=0.00247$ 4; $\alpha(\text{L})=0.000366$ 6; $\alpha(\text{M})=8.04\times 10^{-5}$ 12; $\alpha(\text{N}+..)=2.13\times 10^{-5}$ 3 $\alpha(\text{N})=1.85\times 10^{-5}$ 3; $\alpha(\text{O})=2.67\times 10^{-6}$ 4; $\alpha(\text{P})=1.425\times 10^{-7}$ 20 B(E2)(W.u.)=2440
19008.4	(44 ⁺)	1399.8 1	17608.6	(42 ⁺)	[E2]	1.60×10 ⁻³		$\alpha(\text{K})=0.001319$ 19; $\alpha(\text{L})=0.000185$ 3; $\alpha(\text{M})=4.05\times 10^{-5}$ 6; $\alpha(\text{N}+..)=5.33\times 10^{-5}$ 8 $\alpha(\text{N})=9.33\times 10^{-6}$ 13; $\alpha(\text{O})=1.359\times 10^{-6}$ 19; $\alpha(\text{P})=7.62\times 10^{-8}$ 11; $\alpha(\text{IPF})=4.25\times 10^{-5}$ 6 B(E2)(W.u.)>104
19475.1	(43 ⁻)	986.1 2	18489.0	(41 ⁻)	[E2]	0.00267	100 15 6 2	
		1767	17707.5	(42 ⁺)				
19590.2	(42 ⁻)	1418.1 7	18172.1	(40 ⁻)				
19789.8	(46 ⁺)	1064.9 1	18724.9	(44 ⁺)				
20467.4	(46 ⁺)	1458.9 1	19008.4	(44 ⁺)	[E2]	1.50×10 ⁻³		$\alpha(\text{K})=0.00225$ 4; $\alpha(\text{L})=0.000331$ 5; $\alpha(\text{M})=7.26\times 10^{-5}$ 11; $\alpha(\text{N}+..)=1.93\times 10^{-5}$ 3 $\alpha(\text{N})=1.673\times 10^{-5}$ 24; $\alpha(\text{O})=2.42\times 10^{-6}$ 4; $\alpha(\text{P})=1.300\times 10^{-7}$ 19 B(E2)(W.u.)=2440 B(E2)(W.u.)>84 $\alpha(\text{K})=0.001219$ 17; $\alpha(\text{L})=0.0001702$ 24; $\alpha(\text{M})=3.72\times 10^{-5}$ 6; $\alpha(\text{N}+..)=6.98\times 10^{-5}$ 10 $\alpha(\text{N})=8.58\times 10^{-6}$ 12; $\alpha(\text{O})=1.250\times 10^{-6}$ 18; $\alpha(\text{P})=7.05\times 10^{-8}$ 10; $\alpha(\text{IPF})=5.99\times 10^{-5}$ 9

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^{\ddagger}$	E_f	J_f^π	Mult. #	$\alpha^\ddagger$	$I_{(\gamma+ce)}$	Comments
20506.5	(45 ⁻)	1031.3 2 1781	19475.1 (43 ⁻) 18724.9 (44 ⁺)				100 7 2 1	
20902.5	(48 ⁺)	1112.7 1	19789.8 (46 ⁺)	[E2]	0.00245			$\alpha(\text{K})=0.00206$ 3; $\alpha(\text{L})=0.000300$ 5; $\alpha(\text{M})=6.59\times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.79\times 10^{-5}$ 3 $\alpha(\text{N})=1.518\times 10^{-5}$ 22; $\alpha(\text{O})=2.20\times 10^{-6}$ 3; $\alpha(\text{P})=1.191\times 10^{-7}$ 17; $\alpha(\text{IPF})=4.49\times 10^{-7}$ 7 B(E2)(W.u.)=2450
21077.8	(44 ⁻)	1487.6 3	19590.2 (42 ⁻)					
21583.8	(47 ⁻)	1077.3 2 1795	20506.5 (45 ⁻) 19789.8 (46 ⁺)				100 7 3 1	
22063.0	(50 ⁺)	1160.5 1	20902.5 (48 ⁺)	[E2]	0.00225			$\alpha(\text{K})=0.00190$ 3; $\alpha(\text{L})=0.000274$ 4; $\alpha(\text{M})=6.01\times 10^{-5}$ 9; $\alpha(\text{N}+..)=1.81\times 10^{-5}$ 3 $\alpha(\text{N})=1.386\times 10^{-5}$ 20; $\alpha(\text{O})=2.01\times 10^{-6}$ 3; $\alpha(\text{P})=1.096\times 10^{-7}$ 16; $\alpha(\text{IPF})=2.12\times 10^{-6}$ 3 B(E2)(W.u.)=2420
22706.5	(49 ⁻)	1122.7 2	21583.8 (47 ⁻)					
23271.6	(52 ⁺)	1208.6 1	22063.0 (50 ⁺)	[E2]	0.00208			$\alpha(\text{K})=0.001751$ 25; $\alpha(\text{L})=0.000251$ 4; $\alpha(\text{M})=5.51\times 10^{-5}$ 8; $\alpha(\text{N}+..)=2.09\times 10^{-5}$ 3 $\alpha(\text{N})=1.270\times 10^{-5}$ 18; $\alpha(\text{O})=1.84\times 10^{-6}$ 3; $\alpha(\text{P})=1.012\times 10^{-7}$ 15; $\alpha(\text{IPF})=6.25\times 10^{-6}$ 9 B(E2)(W.u.)=2520
23873.6	(51 ⁻)	1167.1 2	22706.5 (49 ⁻)					
24528.2	(54 ⁺)	1256.6 1	23271.6 (52 ⁺)	[E2]	0.00193			$\alpha(\text{K})=0.001623$ 23; $\alpha(\text{L})=0.000231$ 4; $\alpha(\text{M})=5.07\times 10^{-5}$ 7; $\alpha(\text{N}+..)=2.60\times 10^{-5}$ 4 $\alpha(\text{N})=1.169\times 10^{-5}$ 17; $\alpha(\text{O})=1.697\times 10^{-6}$ 24; $\alpha(\text{P})=9.38\times 10^{-8}$ 14; $\alpha(\text{IPF})=1.252\times 10^{-5}$ 18 B(E2)(W.u.)=2490
25085.2	(53 ⁻)	1211.6 2	23873.6 (51 ⁻)					
25833.0	(56 ⁺)	1304.8 1	24528.2 (54 ⁺)	[E2]	0.00180			$\alpha(\text{K})=0.001509$ 22; $\alpha(\text{L})=0.000214$ 3; $\alpha(\text{M})=4.68\times 10^{-5}$ 7; $\alpha(\text{N}+..)=3.28\times 10^{-5}$ 5 $\alpha(\text{N})=1.080\times 10^{-5}$ 16; $\alpha(\text{O})=1.569\times 10^{-6}$ 22; $\alpha(\text{P})=8.72\times 10^{-8}$ 13; $\alpha(\text{IPF})=2.04\times 10^{-5}$ 3 B(E2)(W.u.)=2580
26341.9	(55 ⁻)	1256.7 2	25085.2 (53 ⁻)					
27185.9	(58 ⁺)	1352.9 1	25833.0 (56 ⁺)	[E2]	1.69×10^{-3}			$\alpha(\text{K})=0.001407$ 20; $\alpha(\text{L})=0.000199$ 3; $\alpha(\text{M})=4.34\times 10^{-5}$ 6; $\alpha(\text{N}+..)=4.21\times 10^{-5}$ 6 $\alpha(\text{N})=1.001\times 10^{-5}$ 14; $\alpha(\text{O})=1.457\times 10^{-6}$ 21; $\alpha(\text{P})=8.13\times 10^{-8}$ 12; $\alpha(\text{IPF})=3.05\times 10^{-5}$ 5 B(E2)(W.u.)=2590
27641.8	(58 ⁻)	1299.9 2	26341.9 (55 ⁻)					
28587.2	(60 ⁺)	1401.3 1	27185.9 (58 ⁺)	[E2]	1.59×10^{-3}			$\alpha(\text{K})=0.001316$ 19; $\alpha(\text{L})=0.000185$ 3; $\alpha(\text{M})=4.04\times 10^{-5}$ 6; $\alpha(\text{N}+..)=5.37\times 10^{-5}$ 8 $\alpha(\text{N})=9.31\times 10^{-6}$ 13; $\alpha(\text{O})=1.356\times 10^{-6}$ 19; $\alpha(\text{P})=7.60\times 10^{-8}$ 11;

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)							Comments
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	E_f	J_f^π	Mult. [#]	$\alpha^\dagger$	
							$\alpha(\text{IPF})=4.30\times 10^{-5}$ 6 B(E2)(W.u.)=2410
28986.1	(59 ⁻)	1344.3 2	27641.8	(58 ⁻)			
30036.8	(62 ⁺)	1449.6 2	28587.2	(60 ⁺)	[E2]	1.51×10^{-3}	$\alpha(\text{K})=0.001234$ 18; $\alpha(\text{L})=0.0001724$ 25; $\alpha(\text{M})=3.77\times 10^{-5}$ 6; $\alpha(\text{N}+..)=6.71\times 10^{-5}$ 10 $\alpha(\text{N})=8.69\times 10^{-6}$ 13; $\alpha(\text{O})=1.267\times 10^{-6}$ 18; $\alpha(\text{P})=7.13\times 10^{-8}$ 10; $\alpha(\text{IPF})=5.70\times 10^{-5}$ 8 B(E2)(W.u.)=2660
30374.5	(61 ⁻)	1388.4 5	28986.1	(59 ⁻)			
31534.6	(64 ⁺)	1497.8 3	30036.8	(62 ⁺)			
31808.0	(63 ⁻)	1433.5 10	30374.5	(61 ⁻)			
33080.2	(66 ⁺)	1545.6 5	31534.6	(64 ⁺)			
33286.1	(65 ⁻)	1478	31808.0	(63 ⁻)			
34660.2	(68 ⁺)	1580	33080.2	(66 ⁺)			
825.9+x	(36)	825.9 10	x	(34)			
1681.3+x	(38)	855.4 2	825.9+x	(36)			
2576.5+x	(40)	895.2 2	1681.3+x	(38)			
3508.7+x	(42)	932.2 2	2576.5+x	(40)			
4478.6+x	(44)	969.9 5	3508.7+x	(42)			
5487.1+x	(46)	1008.5 5	4478.6+x	(44)			
6536.3+x	(48)	1049.2 2	5487.1+x	(46)			
7628.9+x	(50)	1092.6 2	6536.3+x	(48)			
8766.5+x	(52)	1137.6 2	7628.9+x	(50)			
9949.9+x	(54)	1183.4 2	8766.5+x	(52)			
11180.5+x	(56)	1230.6 2	9949.9+x	(54)			
12458.2+x	(58)	1277.7 2	11180.5+x	(56)			
13785.7+x	(60)	1327.4 5	12458.2+x	(58)			
15162.8+x	(62)	1377.1 10	13785.7+x	(60)			
16586.4+x	(64)	1423.6 10	15162.8+x	(62)			
18063.5+x	(66)	1477.1 10	16586.4+x	(64)			
793.00+y	(38)	793.0 2	y	(36)			
1632.7+y	(40)	839.7 2	793.00+y	(38)			
2523.9+y	(42)	891.2 2	1632.7+y	(40)			
3468.7+y	(44)	944.8 2	2523.9+y	(42)			
4466.9+y	(46)	998.2 2	3468.7+y	(44)			
5519.3+y	(48)	1052.4 2	4466.9+y	(46)			
6624.2+y	(50)	1104.9 2	5519.3+y	(48)			
7781.1+y	(52)	1156.9 2	6624.2+y	(50)			
8989.0+y	(54)	1207.9 2	7781.1+y	(52)			
10249.4+y	(56)	1260.4 2	8989.0+y	(54)			
11563.2+y	(58)	1313.8 2	10249.4+y	(56)			
12931.9+y	(60)	1368.6 2	11563.2+y	(58)			
14357.7+y	(62)	1425.8 2	12931.9+y	(60)			
15840.4+y	(64)	1482.7 2	14357.7+y	(62)			
17384.5+y	(66)	1544.1 2	15840.4+y	(64)			
18989.2+y	(68)	1604.7 2	17384.5+y	(66)			

Adopted Levels, Gammas (continued)

$\gamma(^{152}\text{Dy})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\ddagger$	E_f	J_f^π	$E_i(\text{level})$	J_i^π	$E_\gamma^\ddagger$	E_f	J_f^π
669.6+z	(29 ⁻)	669.6 5	z	(27 ⁻)	642.1+u	(28 ⁻)	642.1 5	u	(26 ⁻)
1390.6+z	(31 ⁻)	721.0 2	669.6+z	(29 ⁻)	1337.0+u	(30 ⁻)	694.9 4	642.1+u	(28 ⁻)
2163.4+z	(33 ⁻)	772.8 2	1390.6+z	(31 ⁻)	2084.0+u	(32 ⁻)	747.0 2	1337.0+u	(30 ⁻)
2988.4+z	(35 ⁻)	825.0 2	2163.4+z	(33 ⁻)	2882.8+u	(34 ⁻)	798.8 2	2084.0+u	(32 ⁻)
3865.2+z	(37 ⁻)	876.8 2	2988.4+z	(35 ⁻)	3733.9+u	(36 ⁻)	851.1 2	2882.8+u	(34 ⁻)
4794.2+z	(39 ⁻)	929.0 2	3865.2+z	(37 ⁻)	4635.2+u	(38 ⁻)	901.3 2	3733.9+u	(36 ⁻)
5772.9+z	(41 ⁻)	978.7 2	4794.2+z	(39 ⁻)	5589.0+u	(40 ⁻)	953.8 2	4635.2+u	(38 ⁻)
6802.7+z	(43 ⁻)	1029.8 2	5772.9+z	(41 ⁻)	6594.1+u	(42 ⁻)	1005.1 5	5589.0+u	(40 ⁻)
7883.5+z	(45 ⁻)	1080.8 2	6802.7+z	(43 ⁻)	7649.1+u	(44 ⁻)	1055.0 2	6594.1+u	(42 ⁻)
9014.1+z	(47 ⁻)	1130.6 2	7883.5+z	(45 ⁻)	8754.1+u	(46 ⁻)	1105.0 2	7649.1+u	(44 ⁻)
10194.4+z	(49 ⁻)	1180.3 2	9014.1+z	(47 ⁻)	9909.9+u	(48 ⁻)	1155.8 5	8754.1+u	(46 ⁻)
11422.4+z	(51 ⁻)	1228.0 3	10194.4+z	(49 ⁻)	11115.7+u	(50 ⁻)	1205.8 2	9909.9+u	(48 ⁻)
12703.4+z	(53 ⁻)	1281.0 5	11422.4+z	(51 ⁻)	12369.5+u	(52 ⁻)	1253.8 3	11115.7+u	(50 ⁻)
14031.2+z	(55 ⁻)	1327.7 5	12703.4+z	(53 ⁻)	13673.7+u	(54 ⁻)	1304.2 5	12369.5+u	(52 ⁻)
15407.1+z	(57 ⁻)	1375.9 10	14031.2+z	(55 ⁻)					

[†] Additional information 7.

[‡] Values for levels up to 4016 are weighted averages of all individual measurements from 50-S ε decay and Gd(α ,xn γ),(Hl,xn γ), except where from 162-S ε decay S noted. for higher levels, all data are from the in-beam studies.

From α (K)exp in 50-S and 162-S Ho ε decays, and from α (K)exp, γ (θ), DCO, and lin pol in Gd(α ,xn γ),(Hl,xn γ).

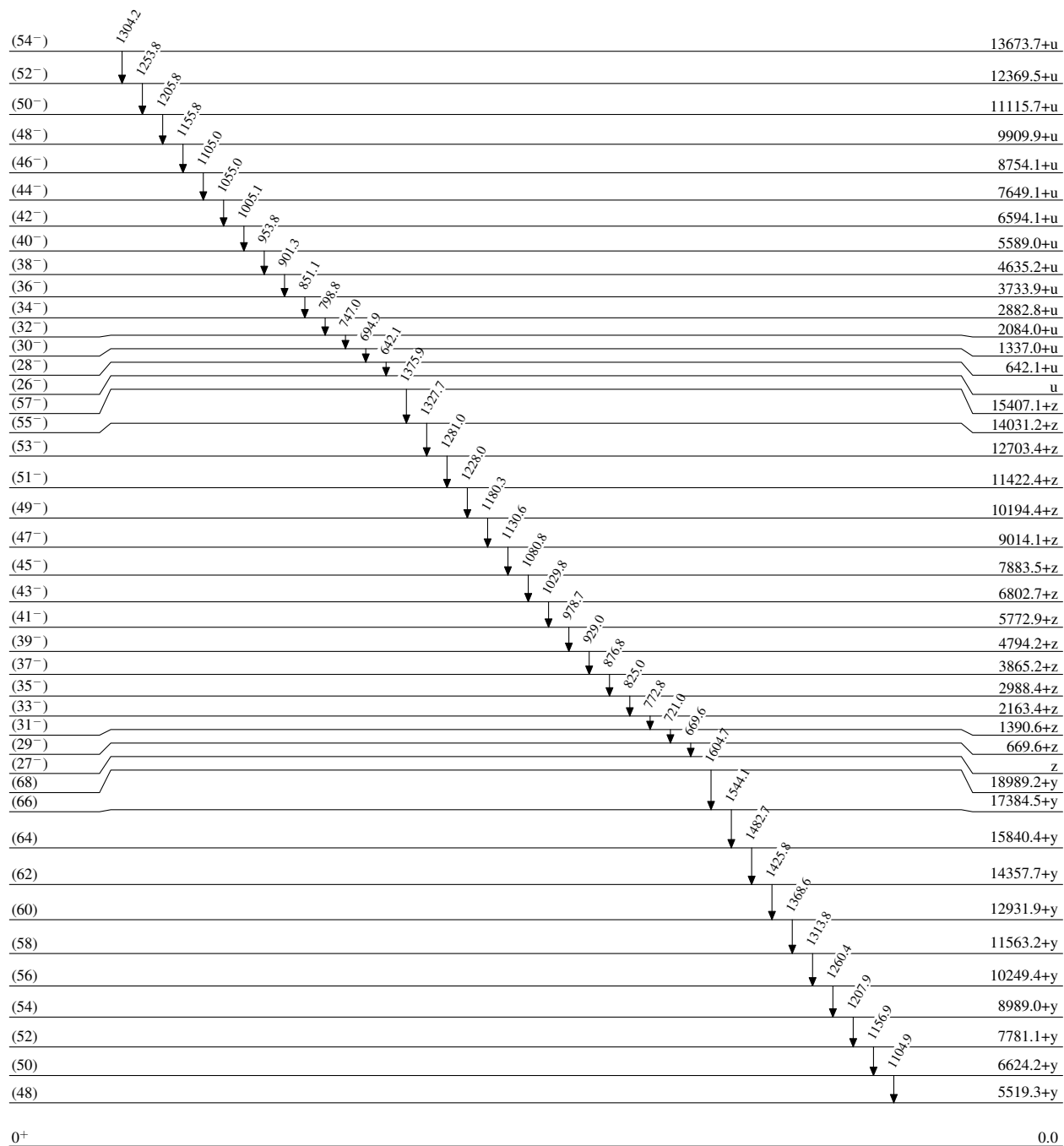
@ $\Delta J=2$ transition.

& $\Delta J=1$ transition.

^a Placement of transition in the level scheme is uncertain.

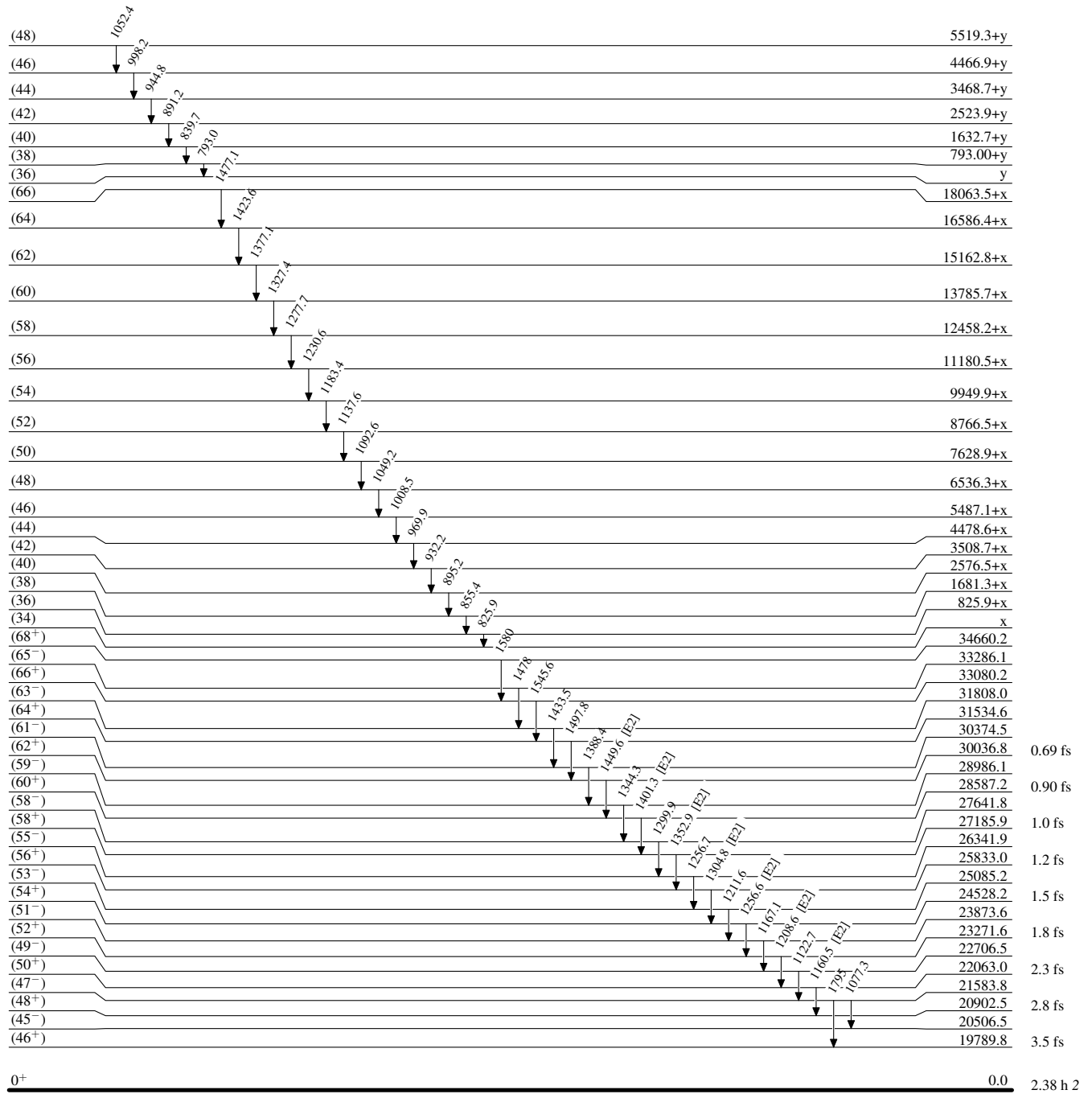
Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level



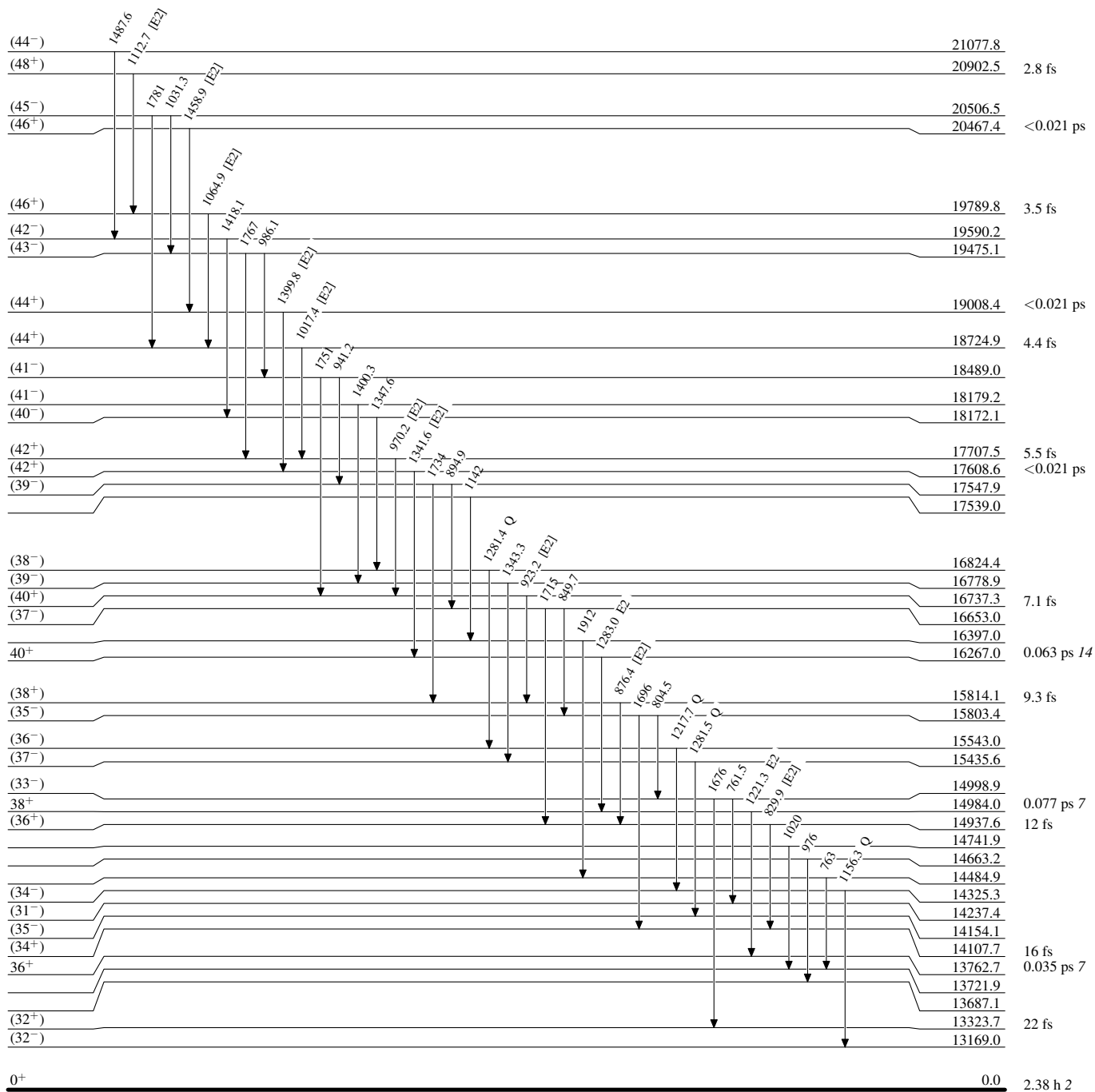
Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level

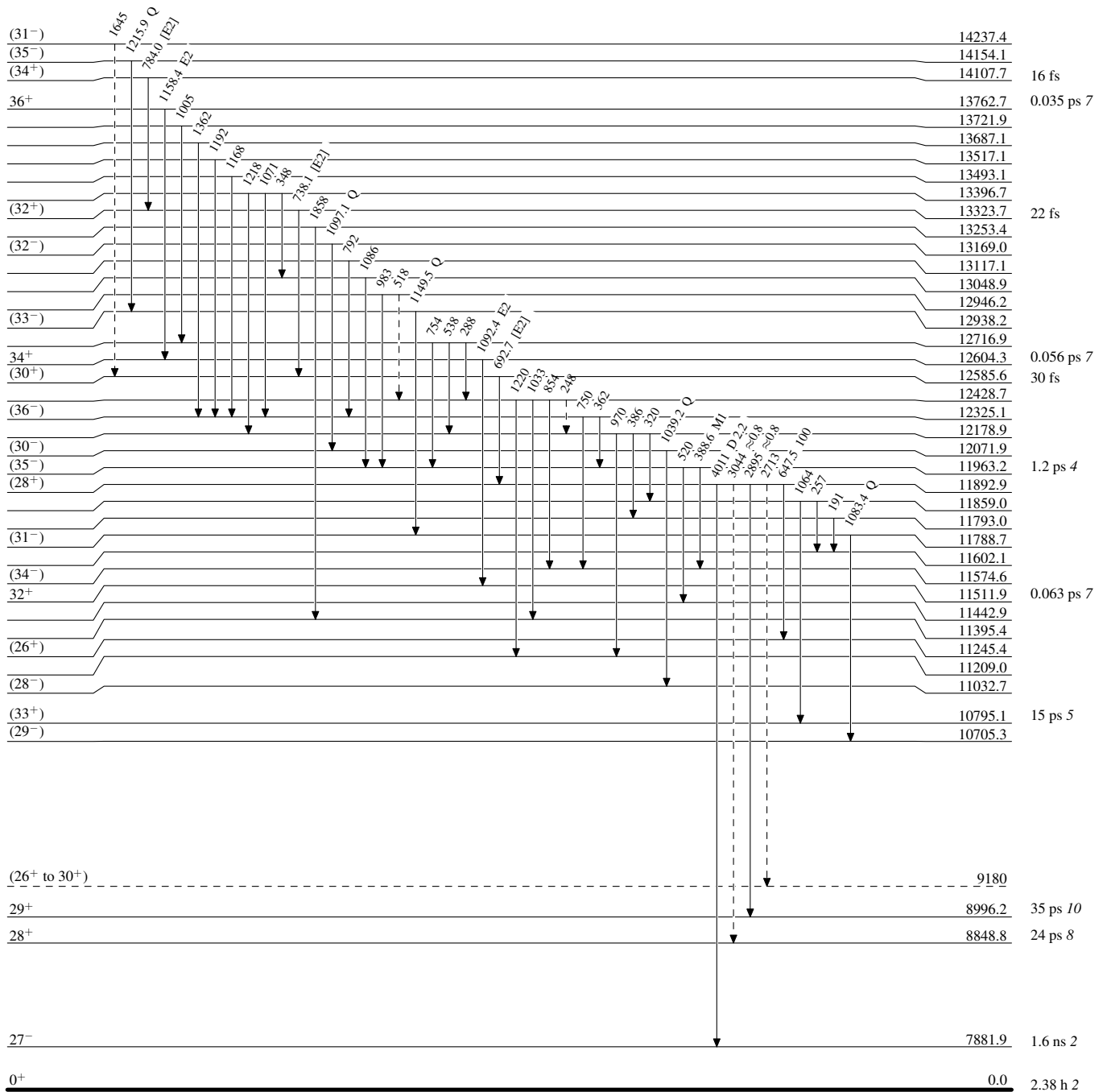


Adopted Levels, Gammas

Legend

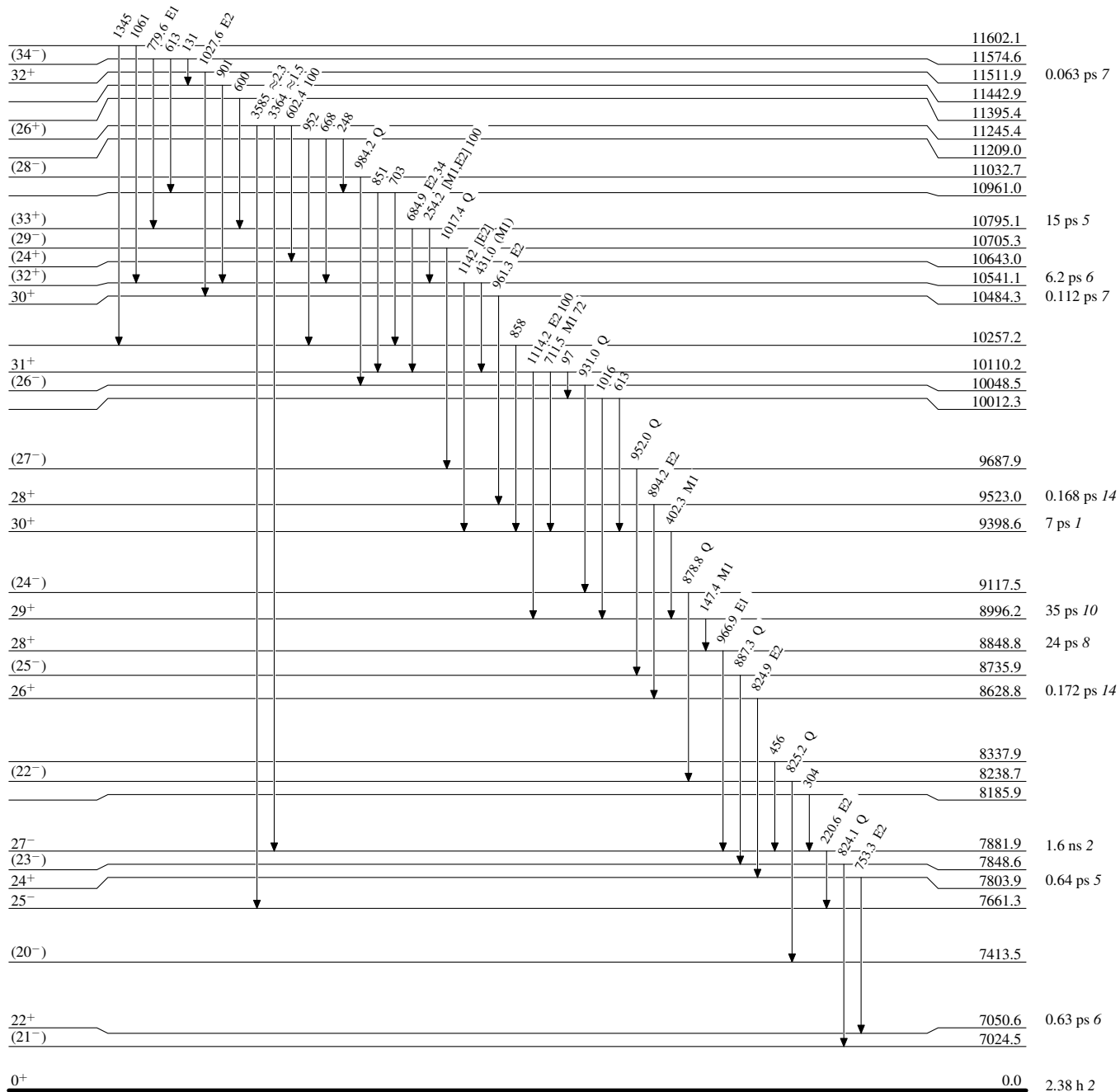
Level Scheme (continued)

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

Adopted Levels, GammasLevel Scheme (continued)

Intensities: Relative photon branching from each level

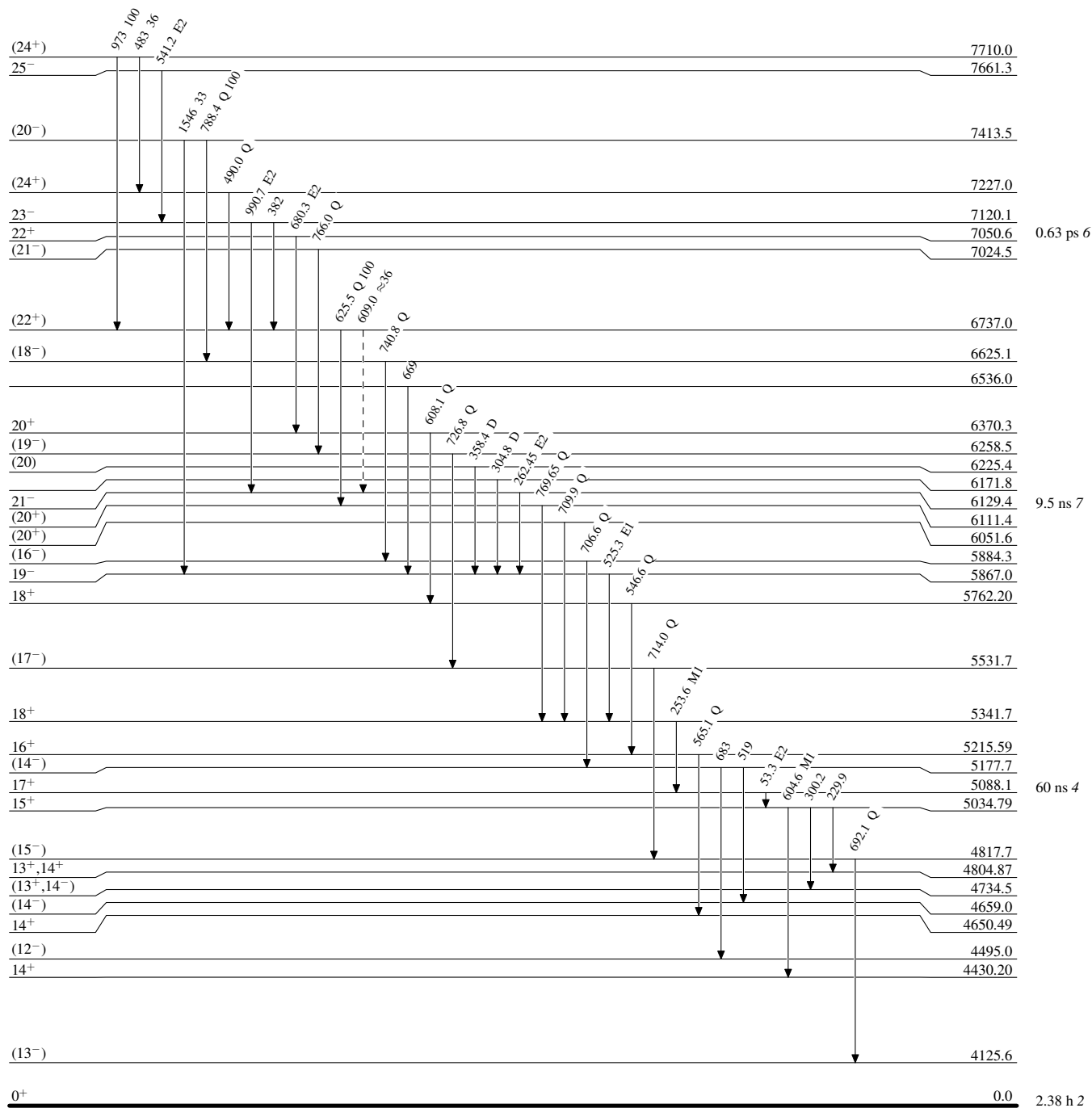


Adopted Levels, Gammas

Legend

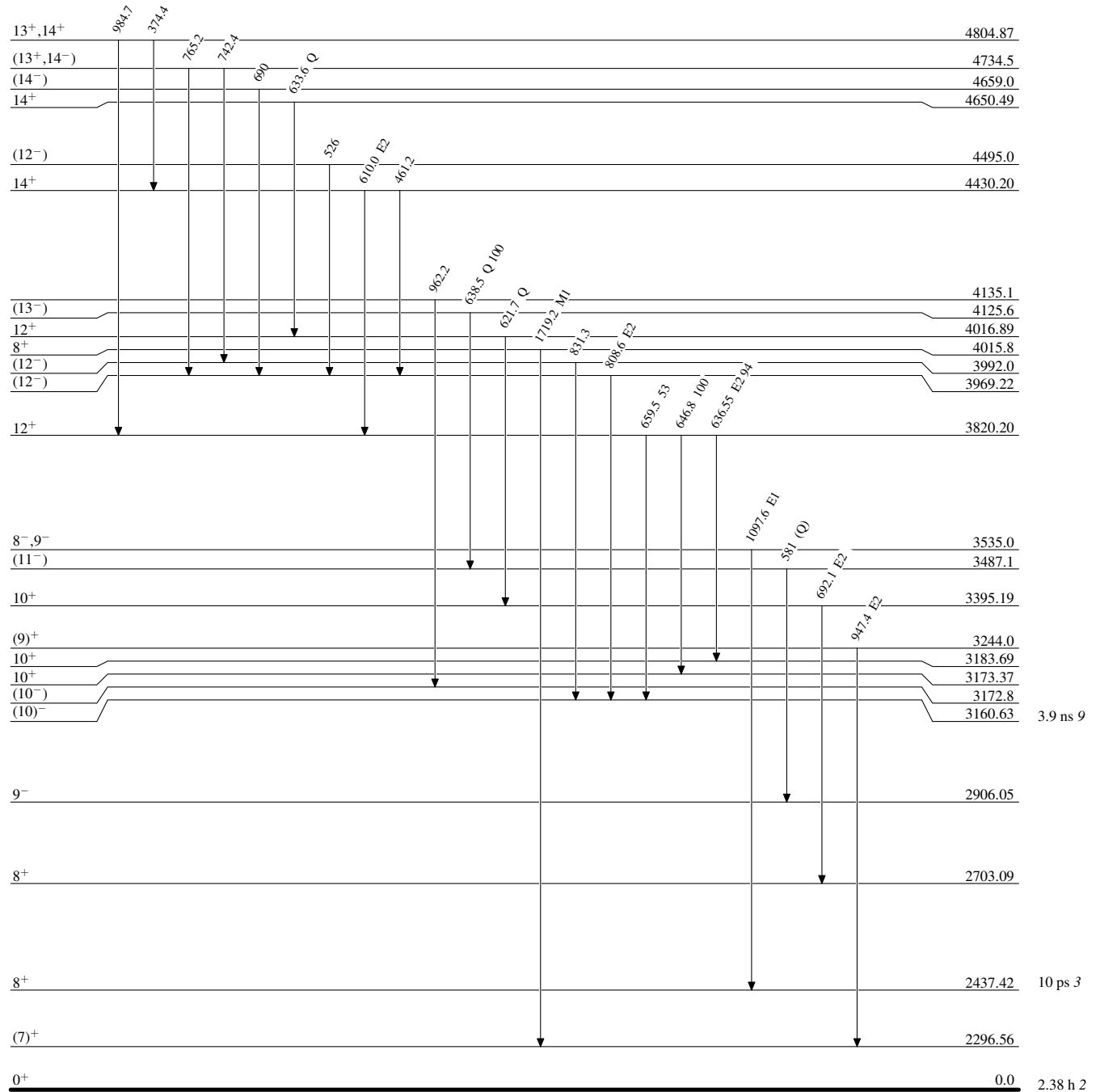
Level Scheme (continued)

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

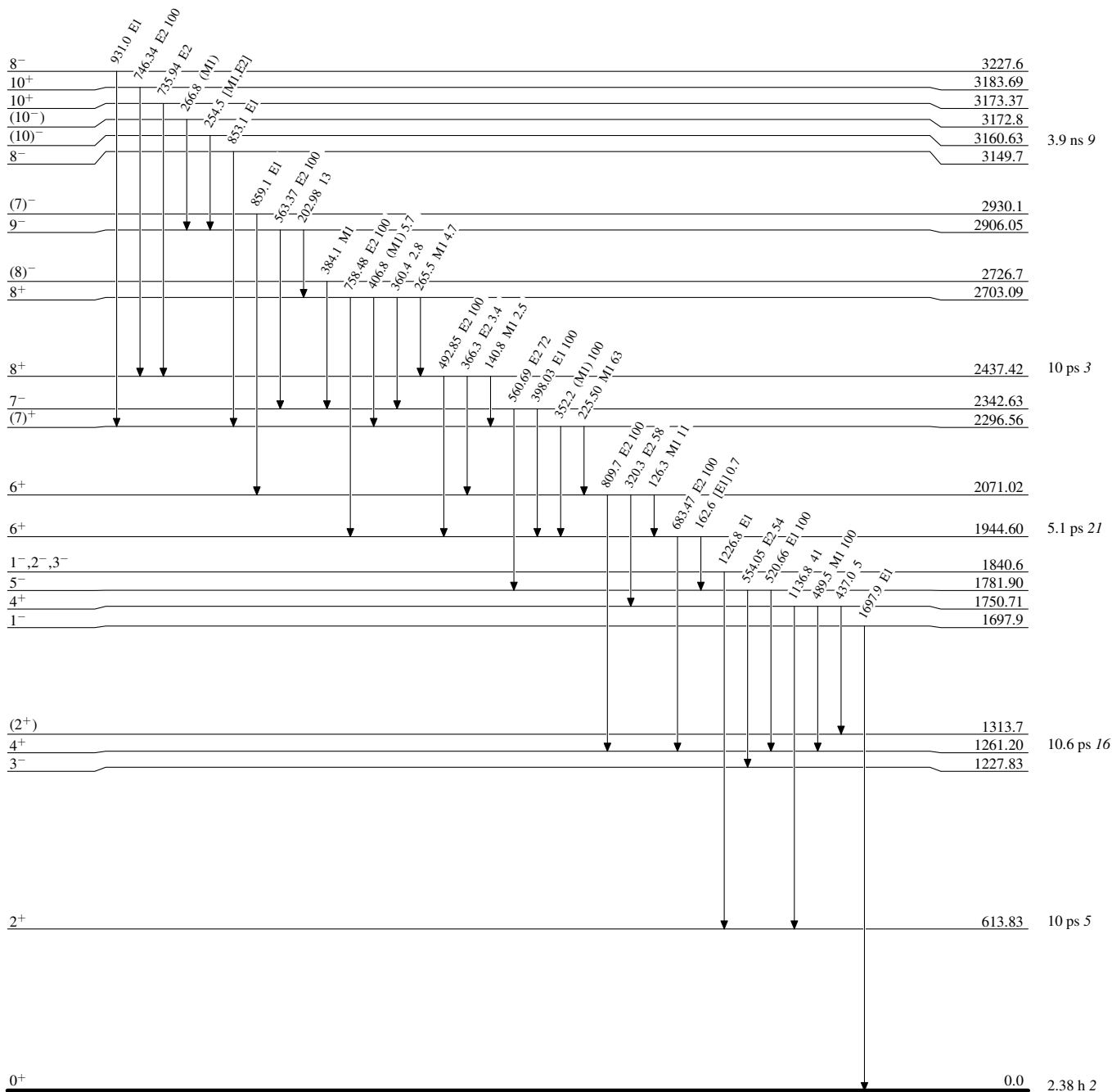
Adopted Levels, GammasLevel Scheme (continued)

Intensities: Relative photon branching from each level



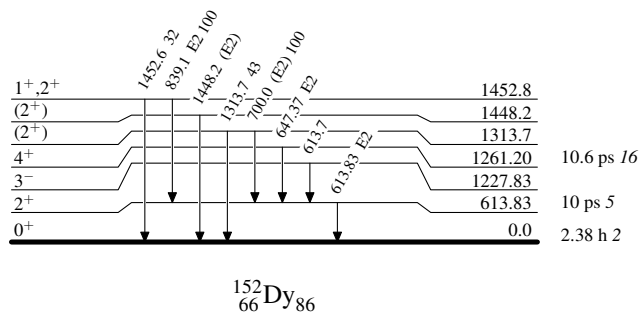
Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Band(A): SD-1 band (1986Tw01,1994Da20, 1991Be12,2002La02, 2002La35,1997Ni01, 1996Sa15,1995Ce08, 1992Sm01,1992Mu10)		Band(B): SD-2 band (1994Da20)	
(68 ⁺)	34660.2	(66)	18063.5+x
(66 ⁺)	1580 ↓ 33080.2	(64)	1477 ↓ 16586.4+x
(64 ⁺)	1546 ↓ 31534.6	(62)	1424 ↓ 15162.8+x
(62 ⁺)	1498 ↓ 30036.8	(60)	1377 ↓ 13785.7+x
(60 ⁺)	1450 ↓ 28587.2	(58)	1327 ↓ 12458.2+x
(58 ⁺)	1401 ↓ 27185.9	(56)	1278 ↓ 11180.5+x
(56 ⁺)	1353 ↓ 25833.0	(54)	1231 ↓ 9949.9+x
(54 ⁺)	1305 ↓ 24528.2	(52)	1183 ↓ 8766.5+x
(52 ⁺)	1257 ↓ 23271.6	(50)	1138 ↓ 7628.9+x
(50 ⁺)	1209 ↓ 22063.0	(48)	1093 ↓ 6536.3+x
(48 ⁺)	1160 ↓ 20902.5	(46)	1049 ↓ 5487.1+x
(46 ⁺)	1113 ↓ 19789.8	(44)	1008 ↓ 4478.6+x
(44 ⁺)	1065 ↓ 18724.9	(42)	970 ↓ 3508.7+x
(42 ⁺)	1017 ↓ 17707.5	(40)	932 ↓ 2576.5+x
(40 ⁺)	970 ↓ 16737.3	(38)	895 ↓ 1681.3+x
(38 ⁺)	923 ↓ 15814.1	(36)	855 ↓ 825.9+x
(36 ⁺)	876 ↓ 14937.6	(34)	826 ↓ x
(34 ⁺)	830 ↓ 14107.7		
(32 ⁺)	784 ↓ 13323.7		
(30 ⁺)	738 ↓ 12585.6		
(28 ⁺)	693 ↓ 11892.9		
(26 ⁺)	648 ↓ 11245.4		
(24 ⁺)	602 ↓ 10643.0		

Adopted Levels, Gammas (continued)

		Band(E): SD-5 band (1994Da20)	
		(54 ⁻)	13673.7+u
		(52 ⁻)	13041 12369.5+u
		(50 ⁻)	12541 11115.7+u
		(48 ⁻)	1206 9909.9+u
		(46 ⁻)	1156 8754.1+u
		(44 ⁻)	1105 7649.1+u
		(42 ⁻)	1055 6594.1+u
		(40 ⁻)	1005 5589.0+u
		(38 ⁻)	954 4635.2+u
		(36 ⁻)	901 3733.9+u
		(34 ⁻)	851 2882.8+u
		(32 ⁻)	799 2084.0+u
		(30 ⁻)	747 1337.0+u
		(28 ⁻)	695 642.1+u
		(26 ⁻)	642 u
		Band(D): SD-4 band (1994Da20)	
		(57 ⁻)	15407.1+z
		(55 ⁻)	1376 14031.2+z
		(53 ⁻)	1328 12703.4+z
		(51 ⁻)	1281 11422.4+z
		(49 ⁻)	1228 10194.4+z
		(47 ⁻)	1180 9014.1+z
		(45 ⁻)	1131 7883.5+z
		(43 ⁻)	1081 6802.7+z
		(41 ⁻)	1030 5772.9+z
		(39 ⁻)	979 4794.2+z
		(37 ⁻)	929 3865.2+z
		(35 ⁻)	877 2988.4+z
		(33 ⁻)	825 2163.4+z
		(31 ⁻)	773 1390.6+z
		(29 ⁻)	721 669.6+z
		(27 ⁻)	670 z
		Band(C): SD-3 band (1994Da20)	
(68)	18989.2+y		
(66)	1605 17384.5+y		
(64)	1544 15840.4+y		
(62)	1483 14357.7+y		
(60)	1426 12931.9+y		
(58)	1369 11563.2+y		
(56)	1314 10249.4+y		
(54)	1260 8989.0+y		
(52)	1208 7781.1+y		
(50)	1157 6624.2+y		
(48)	1105 5519.3+y		
(46)	1052 4466.9+y		
(44)	998 3468.7+y		
(42)	945 2523.9+y		
(40)	891 1632.7+y		
(38)	840 793.00+y		
(36)	793 y		

Adopted Levels, Gammas (continued)**Band(F): SD-6 band (1994Da20,
2002La35)**

(65 ⁻)	33286.1
(63 ⁻)	1478 31808.0
(61 ⁻)	1434 30374.5
(59 ⁻)	1388 28986.1
(58 ⁻)	1344 27641.8
(55 ⁻)	1300 26341.9
(53 ⁻)	1257 25085.2
(51 ⁻)	1212 23873.6
(49 ⁻)	1167 22706.5
(47 ⁻)	1123 21583.8
(45 ⁻)	1077 20506.5
(43 ⁻)	1031 19475.1
(41 ⁻)	986 18489.0
(39 ⁻)	941 17547.9
(37 ⁻)	895 16653.0
(35 ⁻)	850 15803.4
(33 ⁻)	804 14998.9
(31 ⁻)	762 14237.4

**Band(I): Positive parity
 $\Delta J=2$ quasi-rotational
band built on the g.s.
band**

(46 ⁺)	20467.4
(44 ⁺)	1459 19008.4
(42 ⁺)	1400 17608.6
40 ⁺	1342 16267.0
38 ⁺	1283 14984.0
36 ⁺	1221 13762.7
34 ⁺	1158 12604.3
32 ⁺	1092 11511.9
30 ⁺	1028 10484.3
28 ⁺	961 9523.0
26 ⁺	894 8628.8
24 ⁺	825 7803.9
22 ⁺	753 7050.6
20 ⁺	680 6370.3
18 ⁺	608 5762.20
16 ⁺	547 5215.59
12 ⁺	4016.89
10 ⁺	622 3395.19
8 ⁺	692 2703.09

**Band(J): Negative parity
 $\Delta J=2$ band built on the
4495 level**

(44 ⁻)	21077.8
(42 ⁻)	1488 19590.2
(40 ⁻)	1418 18172.1
(38 ⁻)	1348 16824.4
(36 ⁻)	1281 15543.0
(34 ⁻)	1218 14325.3
(32 ⁻)	1156 13169.0
(30 ⁻)	1097 12071.9
(28 ⁻)	1039 11032.7
(26 ⁻)	984 10048.5
(24 ⁻)	931 9117.5
(22 ⁻)	879 8238.7
(20 ⁻)	825 7413.5
(18 ⁻)	788 6625.1
(16 ⁻)	741 5884.3
(14 ⁻)	707 5177.7
(12 ⁻)	683 4495.0

**Band(K): Negative parity
 $\Delta J=2$ band built on the
3487 level**

(41 ⁻)	18179.2
(39 ⁻)	1400 16778.9
(37 ⁻)	1343 15435.6
(35 ⁻)	1282 14154.1
(33 ⁻)	1216 12938.2
(31 ⁻)	1150 11788.7
(29 ⁻)	1083 10705.3
(27 ⁻)	1017 9687.9
(25 ⁻)	952 8735.9
(23 ⁻)	887 7848.6
(21 ⁻)	824 7024.5
(19 ⁻)	766 6258.5
(20)	727 6225.4
(17 ⁻)	727 5531.7
(15 ⁻)	714 4817.7
(13 ⁻)	692 4125.6
(11 ⁻)	638 3487.1

**Band(G)
: Quasi-vibrational
yrast state**

14 ⁺	4430.20
12 ⁺	610 3820.20
10 ⁺	647 3173.37
8 ⁺	736 2437.42
6 ⁺	493 1944.60
4 ⁺	683 1261.20
2 ⁺	647 613.83
0 ⁺	614 0.0

**Band(H): Negative parity
yrast band built on the
1228 level**

14 ⁺	4650.49
3 ⁻	1227.83