

$^{150}\text{Nd}(p,p'\gamma)$ **2011EI09**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, A. A. Sonzogni		NDS 114, 435 (2013)	1-Apr-2013

E=10.9 MeV proton beam impinged on a 1.5 mg/cm² thick ^{150}Nd target enriched to 98% at the Wright Nuclear Structure Laboratory (WNSL) at Yale University. Scattered protons detected by five silicon surface-barrier detectors. Gamma rays detected by the YRAST-Ball spectrometer consisting of ten actively shielded, segmented high-purity germanium (HPGe) clover detectors. Measured E_γ , I_γ , $\gamma\gamma$ -coin, proton- γ coin, E(proton). Deduced levels, J, π , K. Comparisons with IBA model in *sdpf* boson space.

 ^{150}Nd Levels

E(level) [†]	J ^{π}	E(level) [†]	J ^{π}	E(level) [†]	J ^{π}	E(level) [†]	J ^{π}
0.0 [‡]	0 ⁺	1130.0 [‡] 9	8 ⁺	1490.2 15	0,1,2	1777.1 13	1 to 5
130.2 [‡] 6	2 ⁺	1137.6 [#] 9	4 ⁺	1496.7 14	3,(2,4,5)	1782.4 12	(4 ⁺)
381.4 [‡] 6	4 ⁺	1183.5 9	0,1,2	1517.7 10	4,5,6	1800.0 10	(5 ⁻)
676.2 [#] 12	0 ⁺	1200.6 8	3 ⁽⁻⁾	1545.0 9	3 ⁻	1864.5 9	3 ⁻
720.5 [‡] 8	6 ⁺	1284.5 7	1 ⁻	1580.1 9	3 ⁻	1906.4 12	4 ⁺
850.7 [#] 6	2 ⁺	1351.5 [@] 8	4 ⁺	1645.4 10	5,(4)	1909.3 12	0 to 4
853.2 ^{&} 7	1 ⁻	1433.1 ^{&} 11	(7 ⁻)	1645.9 10	3,5,(2,4)	1975.8 13	1 to 5
935.1 ^{&} 7	3 ⁻	1435.4 9	4 ⁺	1648.6 12	1,(0,2)	1985.1 12	1 to 5
1061.8 [@] 6	2 ⁺	1483.6 8	3 ⁻	1738.8 12	0 ⁺		
1129.6 ^{&} 10	5 ⁻	1488.6 9	4,(0,2)	1765.3 9	0 to 3		

[†] From least-squares fit to E_γ data, assuming 0.2 keV uncertainty for each γ ray energy.

[‡] Band(A): $K^\pi=0^+$, g.s. band.

[#] Band(B): $K^\pi=0^+$; β -vibrational band.

[@] Band(C): $K^\pi=2^+$ γ -vibrational band.

[&] Band(D): $K^\pi=0^-$ octupole vibrational band.

 $\gamma(^{150}\text{Nd})$

$E_i(\text{level})$	J _i ^{π}	E_γ	I_γ	E_f	J _f ^{π}	Comments
130.2	2 ⁺	130.2	100	0.0	0 ⁺	
381.4	4 ⁺	251.24	100	130.2	2 ⁺	
676.2	0 ⁺	546.06	100	130.2	2 ⁺	
720.5	6 ⁺	339.70	100	381.4	4 ⁺	
850.7	2 ⁺	469.40	29 4	381.4	4 ⁺	
		720.61	100 13	130.2	2 ⁺	
		850.70	15 6	0.0	0 ⁺	
853.2	1 ⁻	722.91	100 13	130.2	2 ⁺	
		853.01	98 17	0.0	0 ⁺	
935.1	3 ⁻	553.52	36 4	381.4	4 ⁺	
		804.73	100 10	130.2	2 ⁺	
1061.8	2 ⁺	680.29	5.5 8	381.4	4 ⁺	
		931.78	100 11	130.2	2 ⁺	
		1061.98	80 9	0.0	0 ⁺	
1129.6	5 ⁻	409.23	24 4	720.5	6 ⁺	
		748.07	100 12	381.4	4 ⁺	
1130.0	8 ⁺	409.5 5	100	720.5	6 ⁺	E_γ, I_γ : taken from Adopted Gammas, not populated in the current work.
1137.6	4 ⁺	416.94	44 8	720.5	6 ⁺	
		756.4	100 14	381.4	4 ⁺	

Continued on next page (footnotes at end of table)

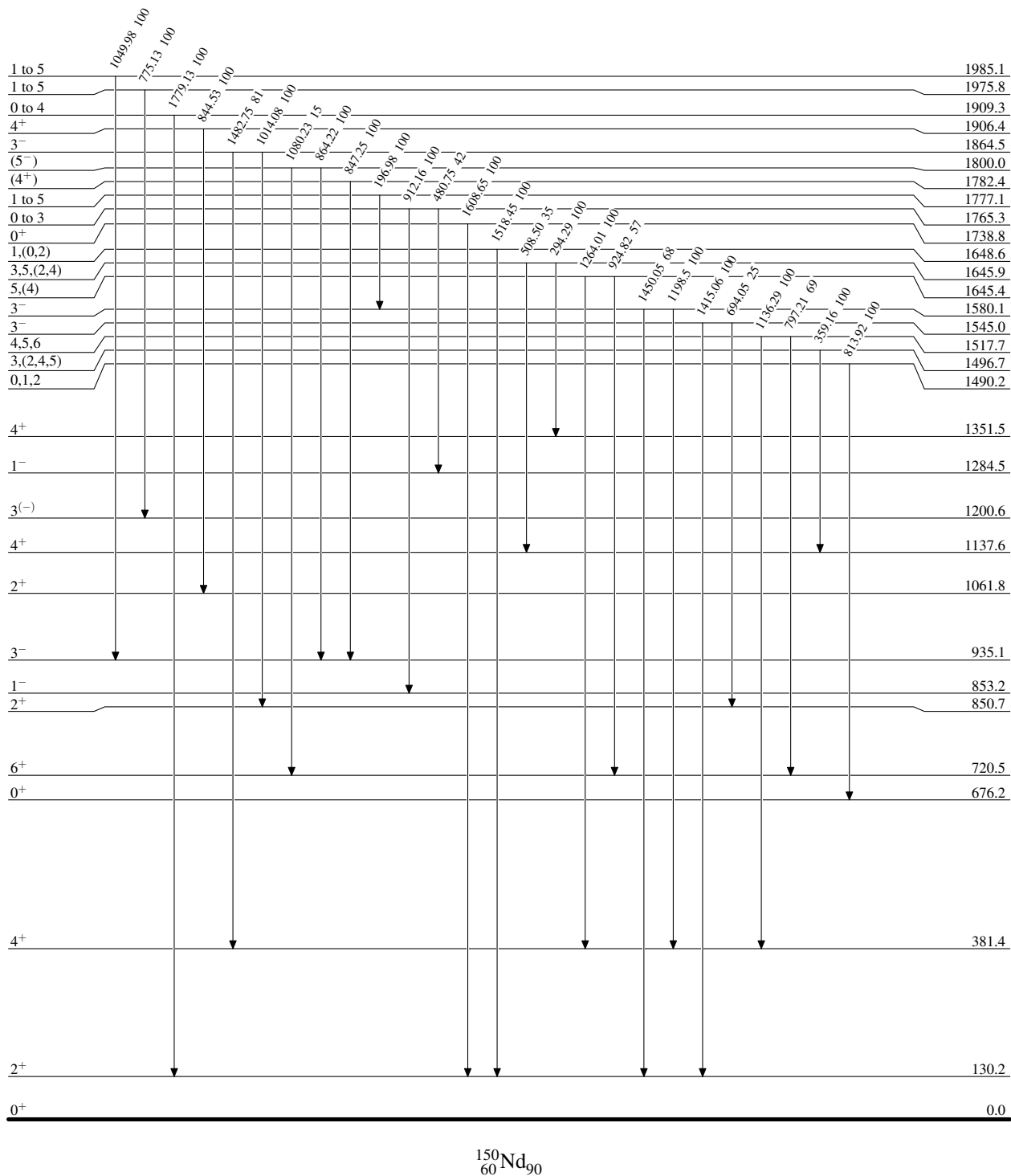
$^{150}\text{Nd}(p,p'\gamma)$ 2011El09 (continued) $\gamma(^{150}\text{Nd})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π
1183.5	0,1,2	248.34	100 14	935.1	3 ⁻	1517.7	4,5,6	1136.29	100 16	381.4	4 ⁺
		330.30	66 10	853.2	1 ⁻	1545.0	3 ⁻	694.05	25 7	850.7	2 ⁺
1200.6	3 ⁽⁻⁾	819.16	22 4	381.4	4 ⁺			1415.06	100 15	130.2	2 ⁺
		1070.15	100 12	130.2	2 ⁺	1580.1	3 ⁻	1198.5	100 12	381.4	4 ⁺
1284.5	1 ⁻	349.63	68 10	935.1	3 ⁻			1450.05	68 9	130.2	2 ⁺
		430.88	100 13	853.2	1 ⁻	1645.4	5,(4)	924.82	57 9	720.5	6 ⁺
		434.09	10 4	850.7	2 ⁺			1264.01	100 14	381.4	4 ⁺
1351.5	4 ⁺	289.57	6.4 10	1061.8	2 ⁺	1645.9	3,5,(2,4)	294.29	100 16	1351.5	4 ⁺
		970.07	100 11	381.4	4 ⁺			508.50	35 9	1137.6	4 ⁺
		1221.42	39 5	130.2	2 ⁺	1648.6	1,(0,2)	1518.45	100	130.2	2 ⁺
1433.1	(7 ⁻)	303.33	50 14	1130.0	8 ⁺	1738.8	0 ⁺	1608.65	100	130.2	2 ⁺
		712.44	100 22	720.5	6 ⁺	1765.3	0 to 3	480.75	42 9	1284.5	1 ⁻
1435.4	4 ⁺	234.41	100	1200.6	3 ⁽⁻⁾			912.16	100 14	853.2	1 ⁻
		373.91	100	1061.8	2 ⁺	1777.1	1 to 5	196.98	100	1580.1	3 ⁻
1483.6	3 ⁻	283.00	32 4	1200.6	3 ⁽⁻⁾	1782.4	(4 ⁺)	847.25	100	935.1	3 ⁻
		421.71	34 4	1061.8	2 ⁺	1800.0	(5 ⁻)	864.22	100 19	935.1	3 ⁻
		1102.14	100 12	381.4	4 ⁺			1080.23	15 7	720.5	6 ⁺
		1353.52	86 11	130.2	2 ⁺	1864.5	3 ⁻	1014.08	100 13	850.7	2 ⁺
1488.6	4,(0,2)	204.15	31 7	1284.5	1 ⁻			1482.75	81 11	381.4	4 ⁺
		1358.31	100 16	130.2	2 ⁺	1906.4	4 ⁺	844.53	100	1061.8	2 ⁺
1490.2	0,1,2	813.92	100	676.2	0 ⁺	1909.3	0 to 4	1779.13	100	130.2	2 ⁺
1496.7	3,(2,4,5)	359.16	100	1137.6	4 ⁺	1975.8	1 to 5	775.13	100	1200.6	3 ⁽⁻⁾
1517.7	4,5,6	797.21	69 15	720.5	6 ⁺	1985.1	1 to 5	1049.98	100	935.1	3 ⁻

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Level Scheme

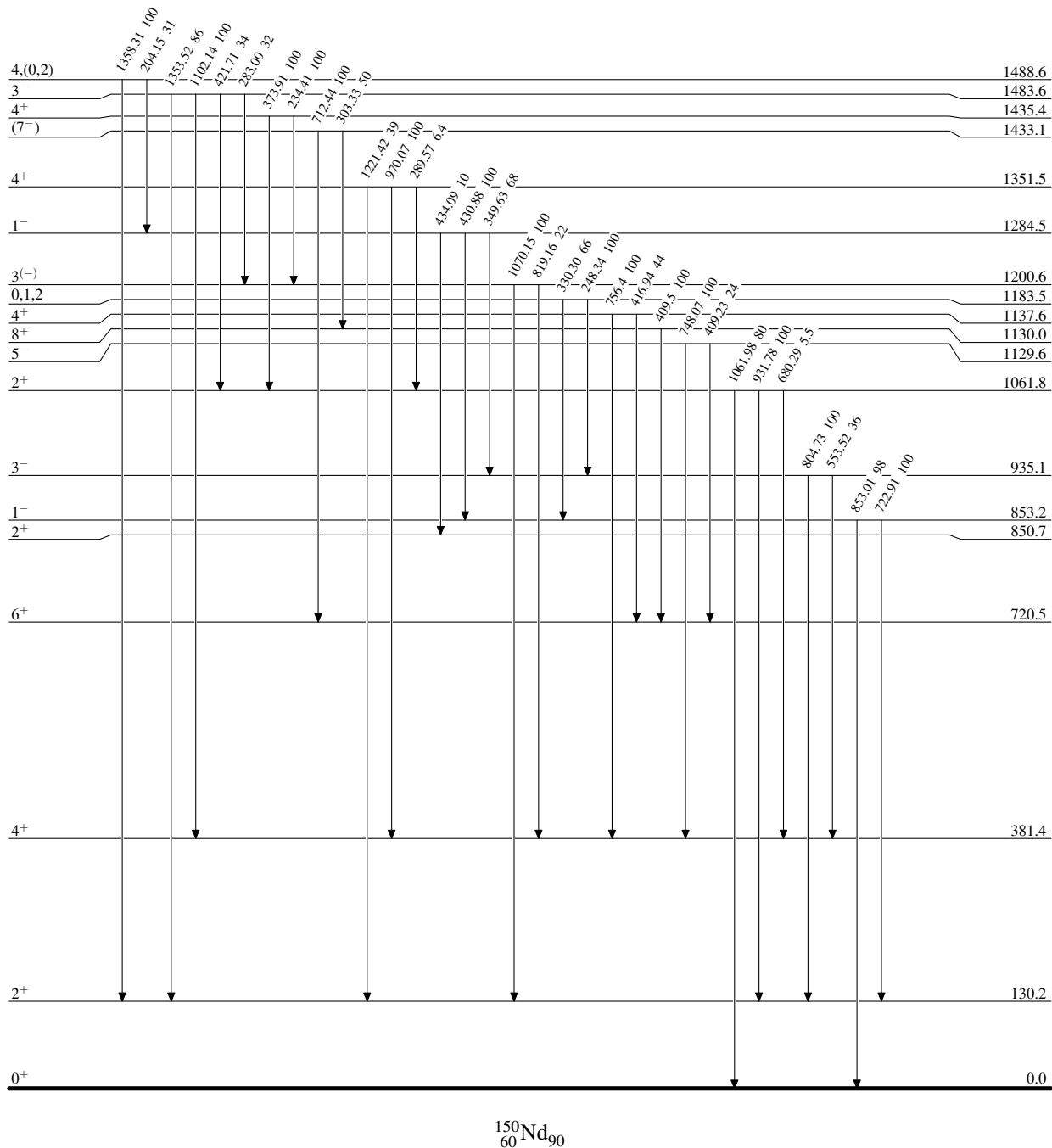
Intensities: Relative photon branching from each level

 $^{150}_{60}\text{Nd}_{90}$

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Level Scheme (continued)

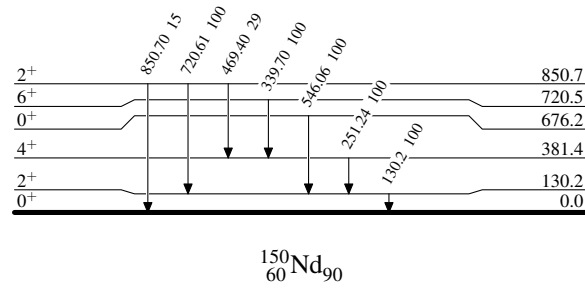
Intensities: Relative photon branching from each level

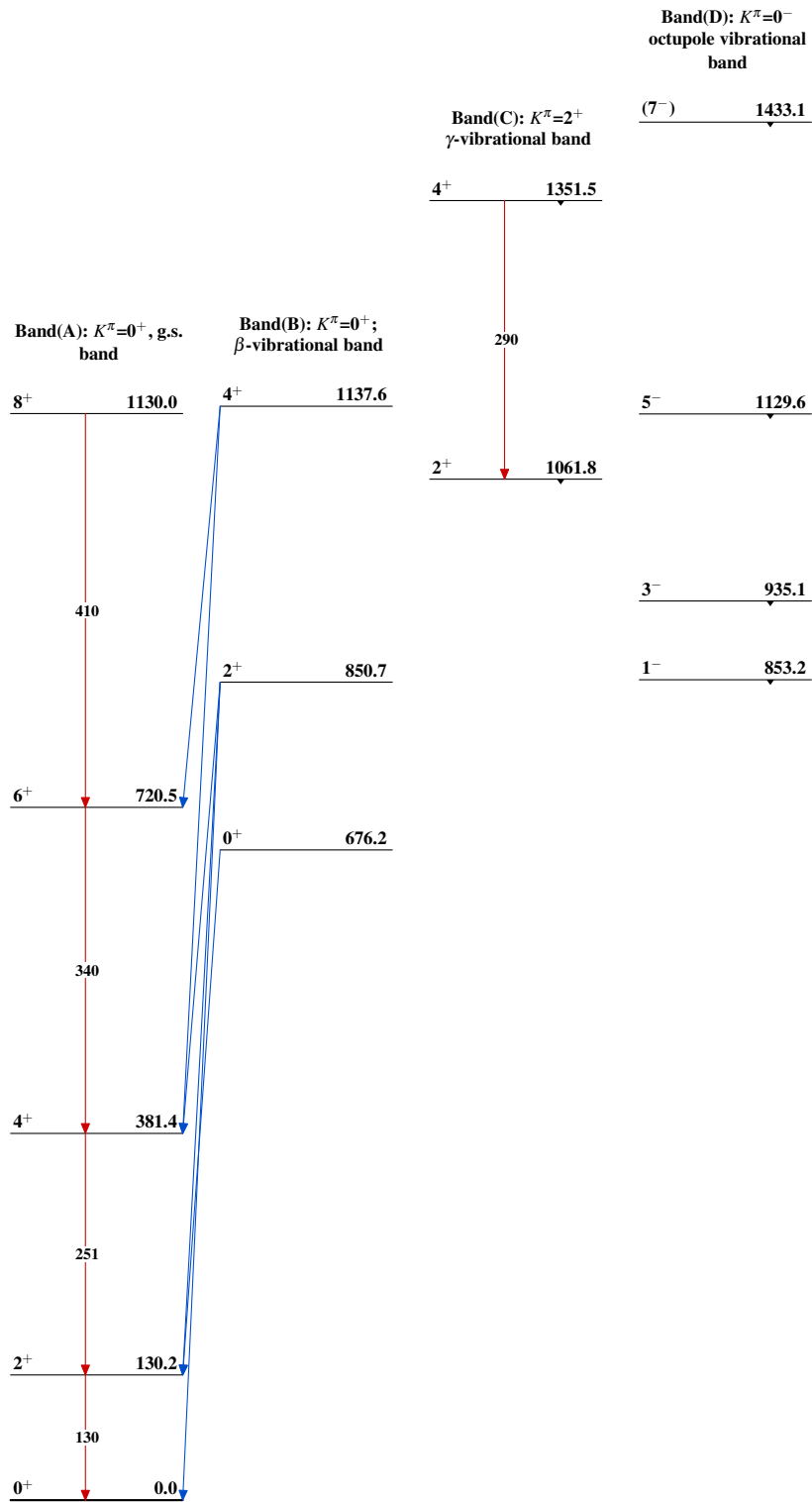
 $^{150}\text{Nd}_{90}$

$^{150}\text{Nd}(p,p'\gamma)$ 2011EI09

Level Scheme (continued)

Intensities: Relative photon branching from each level



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