

$^{160}\text{Gd}(^9\text{Be},\alpha 3n\gamma)$ 2011Sw02

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

2011Sw02 compiled for XUNDL database by J. Choquette and B. Singh (McMaster).

2011Sw02: ^9Be beam at E=57 MeV provided by 14UD tandem accelerator at Australian National University Heavy Ion Accelerator Facility. >95% enriched ^{160}Gd target with thickness of 4.36 mg/cm². Measured E γ , I γ , $\gamma\gamma$, $\gamma\gamma(t)$, pulsed beam, half-lives of isomers using Compton-suppressed CAESAR array of nine large HPGe detectors and two LEPS detectors.

 ^{162}Dy Levels

E(level) [†]	J π	T _{1/2}	Comments
0.0 [‡]	0 ⁺		
80.7 [‡] 8	2 ⁺		
265.5 [‡] 10	4 ⁺		
548.7 [‡] 10	6 ⁺		
888.3 [@] 8	2 ⁺		
921.4 [‡] 10	8 ⁺		
963.1 [@] 10	3 ⁺		
1061.4 [@] 10	4 ⁺		
1148.3 ^a 13	2 ⁻		
1182.7 [@] 10	5 ⁺		
1209.7 ^a 13	3 ⁻		
1297.4 ^a 11	4 ⁻		
1324.6 [@] 11	6 ⁺		
1387.5 ^a 14	5 ⁻		
1485.5 ^b 12	5 ⁻		
1490.4 [@] 11	7 ⁺		
1530.8 ^a 11	6 ⁻		
1536.3 [#] 10	4 ⁺		
1576.1 ^b 11	6 ⁻		
1634.9 [#] 11	5 ⁺		
1637.6 ^a 10	7 ⁻		
1683.6 ^b 10	7 ⁻		
1752.5 [#] 10	6 ⁺		
1807.7 ^b 10	8 ⁻		
1846.1 ^a 10	8 ⁻		
1887.6 [#] 10	7 ⁺		
1939.9 ^b 10	9 ⁻		
1959.3 ^a 10	9 ⁻		
2041.5 [#] 10	8 ⁺		
2187.9 ^{&} 10	8 ⁺	8.3 μs 3	T _{1/2} : from $\gamma\gamma(t)$ (2011Sw02). Proposed configuration= $\nu 11/2[505] \otimes \nu 5/2[523]$, K π =8 ⁺ , based on various considerations in 2011Sw02.
2368.9 ^{&} 13	9 ⁺		
2567.9 ^{&} 13	10 ⁺		Magnitude of g _K -g _R =0.24 4.
2695.9 16	10 ⁺		
2784.9 ^{&} 14	11 ⁺		Magnitude of g _K -g _R =0.27 +8-6.

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$^{160}\text{Gd}(^9\text{Be},\alpha 3n\gamma)$ 2011Sw02 (continued) ^{162}Dy Levels (continued)

† From least-squares fit to E_γ values, assuming 1 keV uncertainty when not stated by 2011Sw02.

‡ Band(A): The g.s. band.

Band(B): $K^\pi=4^+$ band.

@ Band(C): γ band.

& Band(D): $K^\pi=8^+$ band based on 8.3 μs isomer.

^a Band(E): $K^\pi=2^-$ band.

^b Band(F): $K^\pi=5^-$ band.

 $\gamma(^{162}\text{Dy})$

$E_i(\text{level})$	J_i^π	E_γ	E_f	J_f^π
80.7	2 ⁺	81	0.0	0 ⁺
265.5	4 ⁺	185	80.7	2 ⁺
548.7	6 ⁺	283	265.5	4 ⁺
888.3	2 ⁺	808	80.7	2 ⁺
		888	0.0	0 ⁺
921.4	8 ⁺	373	548.7	6 ⁺
963.1	3 ⁺	698	265.5	4 ⁺
		882	80.7	2 ⁺
1061.4	4 ⁺	796	265.5	4 ⁺
		981	80.7	2 ⁺
1148.3	2 ⁻	260	888.3	2 ⁺
1182.7	5 ⁺	220	963.1	3 ⁺
		634	548.7	6 ⁺
		917	265.5	4 ⁺
1209.7	3 ⁻	1129	80.7	2 ⁺
1297.4	4 ⁻	236	1061.4	4 ⁺
		334	963.1	3 ⁺
1324.6	6 ⁺	776	548.7	6 ⁺
		1059	265.5	4 ⁺
1387.5	5 ⁻	1122	265.5	4 ⁺
1485.5	5 ⁻	937	548.7	6 ⁺
		1220	265.5	4 ⁺
1490.4	7 ⁺	308	1182.7	5 ⁺
		569	921.4	8 ⁺
		942	548.7	6 ⁺
1530.8	6 ⁻	233	1297.4	4 ⁻
		348	1182.7	5 ⁺
1536.3	4 ⁺	573	963.1	3 ⁺
		648	888.3	2 ⁺
1576.1	6 ⁻	91	1485.5	5 ⁻
		393	1182.7	5 ⁺
1634.9	5 ⁺	452	1182.7	5 ⁺
		574	1061.4	4 ⁺
		672	963.1	3 ⁺
1637.6	7 ⁻	717	921.4	8 ⁺
		1089	548.7	6 ⁺
1683.6	7 ⁻	107	1576.1	6 ⁻
		762	921.4	8 ⁺
		1135	548.7	6 ⁺
1752.5	6 ⁺	118	1634.9	5 ⁺
		216	1536.3	4 ⁺
		570	1182.7	5 ⁺
		691	1061.4	4 ⁺
1807.7	8 ⁻	124	1683.6	7 ⁻

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$^{160}\text{Gd}(^9\text{Be},\alpha 3n\gamma)$ 2011Sw02 (continued) $\gamma(^{162}\text{Dy})$ (continued)

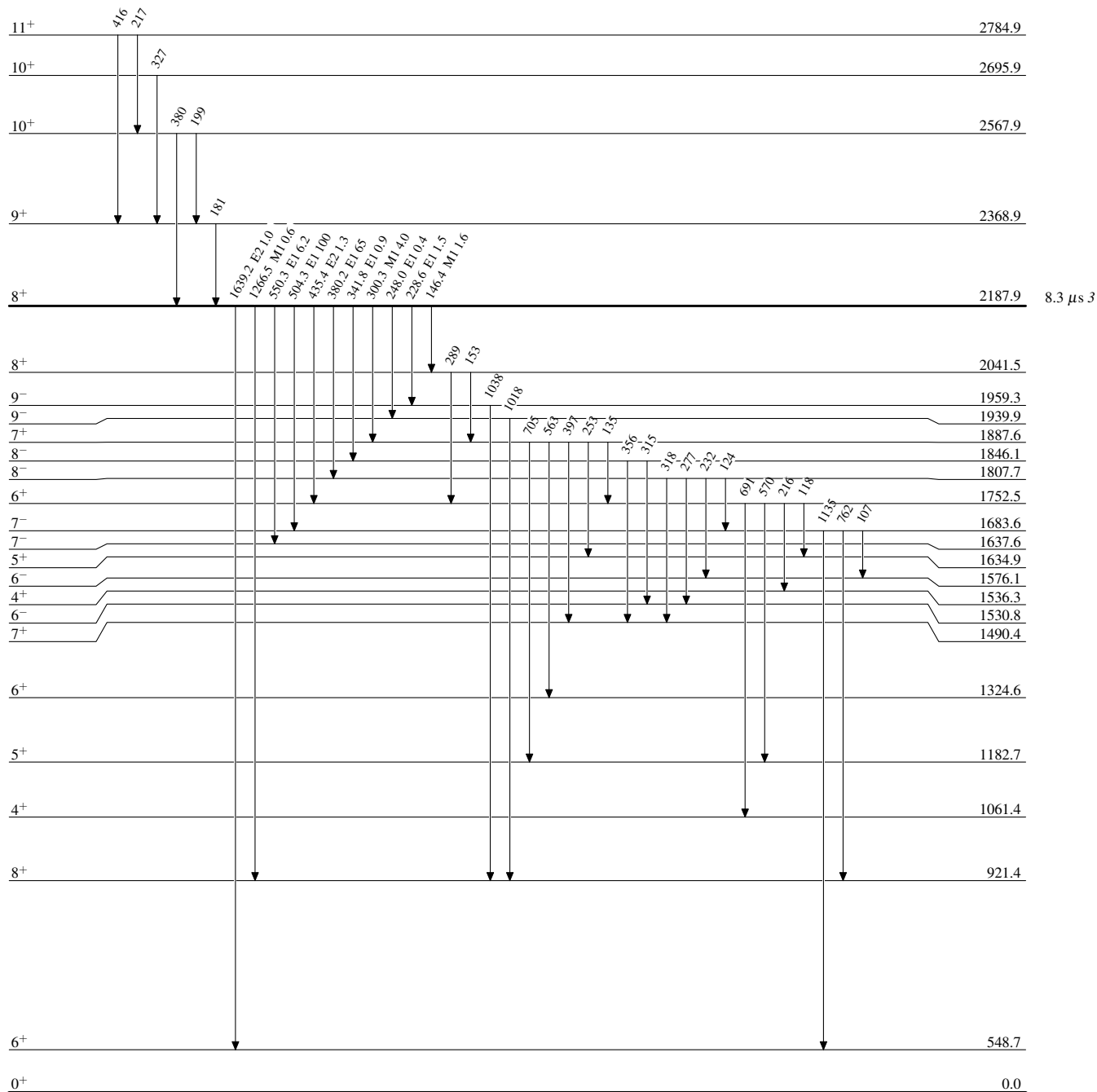
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	a^\dagger	Comments
1807.7	8 ⁻	232		1576.1	6 ⁻			
		277		1530.8	6 ⁻			
		318		1490.4	7 ⁺			
1846.1	8 ⁻	315		1530.8	6 ⁻			
		356		1490.4	7 ⁺			
1887.6	7 ⁺	135		1752.5	6 ⁺			
		253		1634.9	5 ⁺			
		397		1490.4	7 ⁺			
		563		1324.6	6 ⁺			
		705		1182.7	5 ⁺			
1939.9	9 ⁻	1018		921.4	8 ⁺			
1959.3	9 ⁻	1038		921.4	8 ⁺			
2041.5	8 ⁺	153		1887.6	7 ⁺			
		289		1752.5	6 ⁺			
2187.9	8 ⁺	146.4 1	1.6 2	2041.5	8 ⁺	M1	0.810	Reduced hindrance factor $f_\gamma=516$ 23.
		228.6 1	1.5 3	1959.3	9 ⁻	E1	0.034	Reduced hindrance factor $f_\gamma=140$ 6.
		248.0 1	0.4 1	1939.9	9 ⁻	E1	0.028	Reduced hindrance factor $f_\gamma=5.1\text{E}5$ 7.
		300.3 1	4.0 3	1887.6	7 ⁺	M1	0.113	Reduced hindrance factor $f_\gamma=780$ 22.
		341.8 1	0.9 2	1846.1	8 ⁻	E1	0.013	Reduced hindrance factor $f_\gamma=197$ 9.
		380.2 1	65 2	1807.7	8 ⁻	E1	0.010	Reduced hindrance factor $f_\gamma=7.6\text{E}4$ 2.
		435.4 1	1.3 2	1752.5	6 ⁺	E2	0.022	Reduced hindrance factor $f_\gamma=1312$ 116.
		504.3 1	100 1	1683.6	7 ⁻	E1	0.005	Reduced hindrance factor $f_\gamma=9.3\text{E}4$ 2.
		550.3 1	6.2 4	1637.6	7 ⁻	E1	0.004	Reduced hindrance factor $f_\gamma=179$ 3.
		1266.5 2	0.6 2	921.4	8 ⁺	M1	0.003	Reduced hindrance factor $f_\gamma=42.2$ 28.
		1639.2 2	1.0 2	548.7	6 ⁺	E2	0.001	Reduced hindrance factor $f_\gamma=34.5$ 14.
2368.9	9 ⁺	181		2187.9	8 ⁺			
2567.9	10 ⁺	199		2368.9	9 ⁺			
		380		2187.9	8 ⁺			
2695.9	10 ⁺	327		2368.9	9 ⁺			
2784.9	11 ⁺	217		2567.9	10 ⁺			
		416		2368.9	9 ⁺			

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

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Level Scheme

Intensities: Relative photon branching from each level

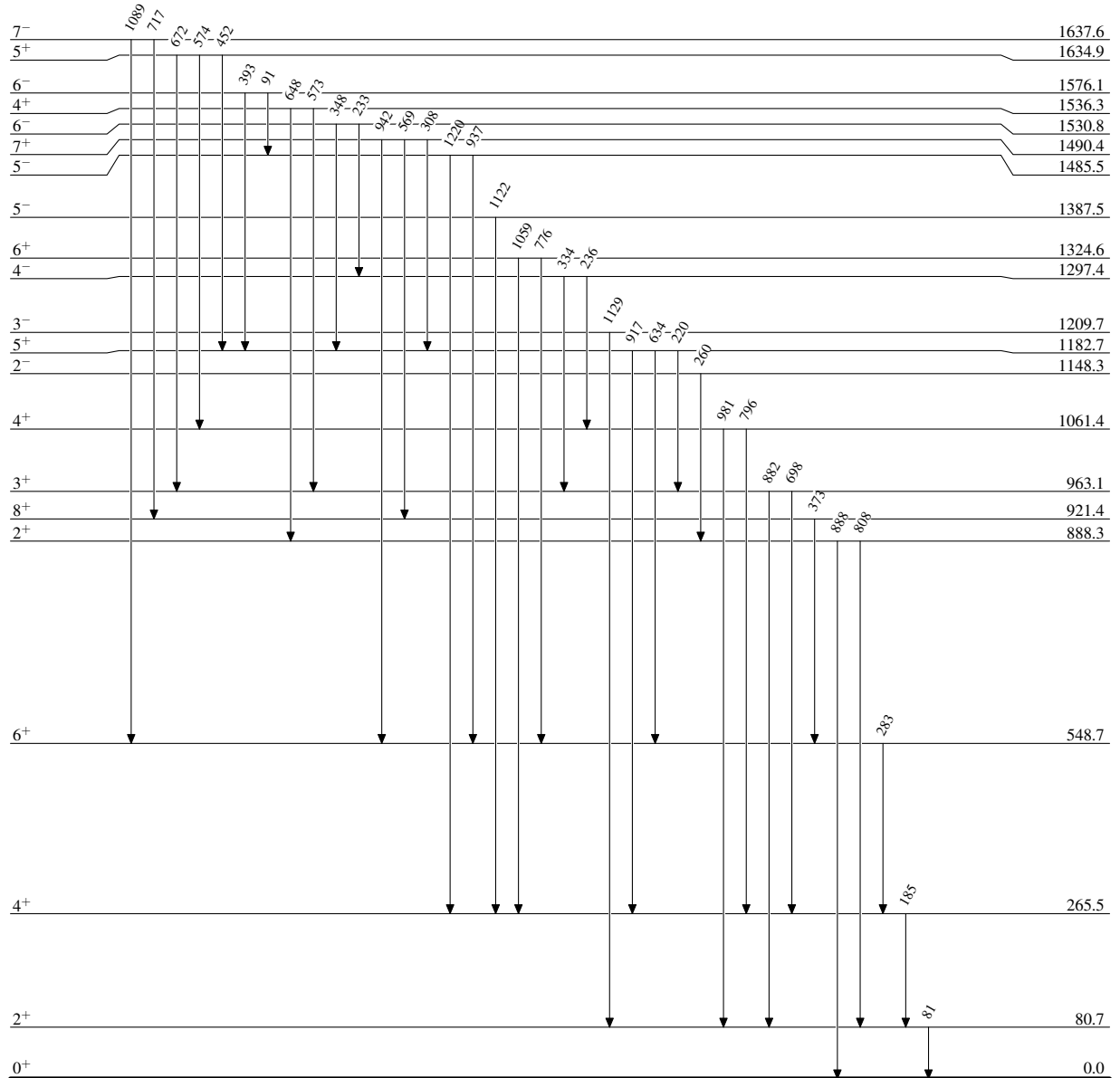


$^{162}_{66}\text{Dy}_{96}$

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Level Scheme (continued)

Intensities: Relative photon branching from each level

 $^{162}_{66}\text{Dy}_{96}$

$^{160}\text{Gd}(^9\text{Be},\alpha 3n\gamma)$ 2011Sw02