^{144}Nd(n,n′γ) 1998Hi09

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	A. A. Sonzogni	NDS 93, 599 (2001)	1-Dec-2000

Neutrons from ^{3}H(p,n) reaction; E(n)=2.2-3.3 MeV. Measured γ(θ), DSAM, excitation functions. HPGe with Compton suppression. Other measurements: 1983Al11, 1984Ga31.

^{144}Nd Levels

E(level)‡	Jπ†	$T_{1/2}$#	E(level)‡	Jπ†	$T_{1/2}$#
0	0^+		2829.42 *4*	(2^+)	0.07 ps *+7−3*
696.578 *9*	2^+		2834.72 *3*	(4^+)	>0.7 ps
1314.712 *17*	4^+		2839.59 *4*	2^+	0.2 ps *+4−1*
1510.826 *13*	3^-		2868.22 *4*	(3,2)	>0.14 ps
1561.065 *17*	2^+		2888.04 *6*	(5,4)	>0.7 ps
1791.43 *3*	6^+	>0.7 ps	2901.53 *3*	2^+	>0.06 ps
2072.95 *3*	2^+	55 fs *+13−10*	2905.16 *3*	$1^{(+)}$	24 fs *+10−7*
2084.71 *4*	0^+	0.12 ps *+8−4*	2951.17 *6*	$3^{(+)}$	>58 fs
2093.36 *3*	5^-		2961.74 *7*	(2^+)	0.13 ps *+24−6*
2110.032 *20*	4^+	>0.2 ps	2968.37 *5*	3^-	24 fs *+51−17*
2178.960 *22*	3^+	0.06 ps *+4−2*	2975.48 *8*	1	17 fs *+12−8*
2186.029 *22*	1^-	14.6 fs *21*	2980.11 *6*	4^+	0.03 ps *+3−2*
2204.85 *5*	4^-	>0.7 ps	2986.06 *3*	4^+	
2218.24 *4*	6^+	>0.7 ps	3000.19 *5*		
2295.522 *22*	4^+	>0.27 ps	3020.53 *9*	$(4^+,3)$	
2328.20 *4*	0^+	0.3 ps *+6−1*	3026.3 *4*		
2368.74 *3*	2^+	39 fs *+15−10*	3029.06 *12*		
2420.86 *3*	5^+	>0.7 ps	3043.60 *9*	(3^+)	0.10 ps *+78−6*
2451.82 *3*	4^+	39 fs *+14−10*	3048.31 *9*		
2527.803 *22*	2^+	40 fs *+8−6*	3053.36 *9*	5^-	
2564.375 *22*	(3^+)		3065.18 *16*	(5,4)	
2582.35 *4*	(3^+)		3070.95 *7*	(3^+)	26 fs *+12−8*
2592.55 *3*	2^+	0.19 ps *+13−6*	3100.31 *7*	2^+	0.07 ps *+11−3*
2601.73 *3*	4^+	0.13 ps *+12−5*	3104.61 *12*		
2606.05 *3*	3^-	0.101 ps *+20−15*	3126.62 *8*	(3,2)	
2655.14 *3*	3^+	>0.7 ps	3133.2 *5*		
2655.55 *3*	1^+	9.9 fs *8*	3136.7 *3*		
2675.65 *4*	0^+	0.2 ps *+5−1*	3145.89 *5*		
2693.00 *4*	2^+	>0.12 ps	3169.82 *14*	$1^{(+)}$	
2715.79 *6*	(5,6)	>0.7 ps	3185.61 *13*	(1,2)	
2720.31 *4*	2^+	0.14 ps *+8−4*	3202.6 *3*	(3)	
2732.89 *4*	4^+	0.2 ps *+11−1*	3214.0 *5*	(1,2)	
2743.29 *5*	0^+	0.07 ps *+5−2*	3222.32 *18*		
2775.46 *4*	(6,4)		3245.5 *5*	(1,2)	
2779.02 *3*	3^-	0.07 ps *+5−2*	3252.4 *5*		
2808.79 *7*	6^+	>44 fs			

† As given by authors. From excitation functions, γ(θ) and statistical model calculations.
‡ From least-squares fit to Eγ.
# From DSAM; $T_{1/2}$ larger than 0.7 ps could not be measured.

^{144}Nd(n,n′γ) 1998Hi09 (continued)

γ(^{144}Nd)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
197.02 *6*		1510.826	3^-	1314.712	4^+	E1		
202.74 *3*	51 *1*	2420.86	5^+	2218.24	6^+	D+Q	−0.06 *+12−10*	
302.31 *4*	12 *1*	2093.36	5^-	1791.43	6^+	E1		
310.82 *3*	34 *1*	2420.86	5^+	2110.032	4^+	D+Q	−0.03 *6*	
426.92 *3*	100	2218.24	6^+	1791.43	6^+	D+Q	−0.22 *+17−9*	
454.01 *3*	44 *1*	2564.375	(3^+)	2110.032	4^+	D+Q	−1.0 *10*	
476.91 *3*	100	1791.43	6^+	1314.712	4^+	E2		
539.20 *3*	50 *5*	2834.72	(4^+)	2295.522	4^+			
582.34 *6*	10 *1*	2093.36	5^-	1510.826	3^-	E2		
618.11 *4*	100	1314.712	4^+	696.578	2^+	E2		
624.7		2186.029	1^-	1561.065	2^+	E1		
628.64 *8*	15 *1*	2420.86	5^+	1791.43	6^+	D+Q	−1.0 *8*	
660.42 *6*	15 *1*	2839.59	2^+	2178.960	3^+	M1+E2	−0.2 *3*	
667.97 *6*		2178.960	3^+	1510.826	3^-	E1		
675.8 *4*		2186.029	1^-	1510.826	3^-	E2		
682.10 *3*	100	2775.46	(6,4)	2093.36	5^-			
694.3 *4*		2204.85	4^-	1510.826	3^-			
696.51 *1*	100	696.578	2^+	0	0^+	E2		
722.66 *9*	10 *1*	2901.53	2^+	2178.960	3^+	M1+E2	+1.3 *+13−10*	
724.63 *5*	18 *2*	2834.72	(4^+)	2110.032	4^+			
734.97 *5*	4 *2*	2295.522	4^+	1561.065	2^+	E2		
778.52 *3*	78 *2*	2093.36	5^-	1314.712	4^+	E1		
784.55 *3*	12 *2*	2295.522	4^+	1510.826	3^-	E1		
794.96 *3*	3 *1*	2110.032	4^+	1314.712	4^+	M1+E2	−0.5 *+8−5*	
794.96 *8*	26 *3*	2888.04	(5,4)	2093.36	5^-			I_γ: from author′s private communication.
814.17 *1*		1510.826	3^-	696.578	2^+	E1		
834.84 *11*	61 *8*	3053.36	5^-	2218.24	6^+			
841.08 *6*	48 *1*	2951.17	$3^{(+)}$	2110.032	4^+	(M1+E2)	+1.3 *13*	
864.34[#] *3*		1561.065	2^+	696.578	2^+	M1+E2	−0.9 *+2−12*	δ value is compromised due to multiplet.
864.34[#] *3*		2178.960	3^+	1314.712	4^+			
877.94[@]	11 *1*	2951.17	$3^{(+)}$	2072.95	2^+	(M1+E2)	−0.8 *8*	
890.13 *4*		2204.85	4^-	1314.712	4^+			
924.41 *9*	27 *1*	2715.79	(5,6)	1791.43	6^+			
933.69 *14*	30 *1*	3043.60	(3^+)	2110.032	4^+	(M1+E2)	−0.1 *+4−17*	
947.50 *14*	20 *3*	3126.62	(3,2)	2178.960	3^+			
954.7[@]	20 *5*	3065.18	(5,4)	2110.032	4^+			
966.58 *4*	16 *1*	2527.803	2^+	1561.065	2^+	M1+E2	+0.09 *+16−4*	
970.9[@]	24 *6*	3065.18	(5,4)	2093.36	5^-			
980.76 *4*	77 *2*	2295.522	4^+	1314.712	4^+	M1+E2	−0.47 *11*	
997.60[@]	11 *1*	3070.95	(3^+)	2072.95	2^+	(M1+E2)	+0.3 *+17−4*	
1003.44 *3*	23 *1*	2564.375	(3^+)	1561.065	2^+	D+Q	+0.78 *+19−11*	
1006.06 *20*	25 *4*	3185.61	(1,2)	2178.960	3^+			
1017.27 *8*	46 *2*	2808.79	6^+	1791.43	6^+	M1+E2	+3.11 *+20−14*	
1027.49 *18*	23 *1*	3100.31	2^+	2072.95	2^+	M1+E2	+0.7 *9*	
1031.30 *8*	7 *1*	2592.55	2^+	1561.065	2^+	M1+E2	+0.63 *6*	
1039.8 *5*	100	3133.2		2093.36	5^-			
1044.0 *5*	50 *9*	3136.7		2093.36	5^-			
1053.63 *8*	8 *1*	2564.375	(3^+)	1510.826	3^-			
1081.64 *8*	7 *1*	2592.55	2^+	1510.826	3^-	E1		
1094.66 *6*	31 *1*	2606.05	3^-	1510.826	3^-	M1(+E2)	−3 *+7−3*	
1131.81 *8*	15 *1*	2693.00	2^+	1561.065	2^+	M1+E2		
1137.02 *4*	77 *1*	2451.82	4^+	1314.712	4^+	M1+E2	+0.63 *+22−56*	
1171.9	3 *1*	2732.89	4^+	1561.065	2^+	E2		

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^{144}Nd(n,n′γ) 1998Hi09 (continued)

γ(^{144}Nd) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
1182.06 *7*	12 *3*	2693.00	2^+	1510.826	3^-	E1		
1182.06 *7*		2743.29	0^+	1561.065	2^+	E2		
1217.93 *16*	12 *2*	2779.02	3^-	1561.065	2^+	E1		
1268.12 *4*	35 *3*	2779.02	3^-	1510.826	3^-	M1+E2		δ: =−0.37 +*18*−*10*, value is compromised due to multiplet.
1268.12 *4*	17 *2*	2829.42	(2^+)	1561.065	2^+	M1+E2		δ: =−0.19 +*14*−*17*, value is compromised due to multiplet.
1286.97 *3*	75 *1*	2601.73	4^+	1314.712	4^+	M1+E2	+0.3 +*4*−*2*	
1318.6 *5*	11 *1*	2829.42	(2^+)	1510.826	3^-	E1		
1323.98 *10*	32 *3*	2834.72	(4^+)	1510.826	3^-			
1340.42 *2*	100	2655.14	3^+	1314.712	4^+	M1+E2		
1340.42 *3*	24 *3*	2901.53	2^+	1561.065	2^+			
1343.30 *9*	40 *1*	2905.16	$1^{(+)}$	1561.065	2^+			
1357.37 *4*	72 *1*	2868.22	(3,2)	1510.826	3^-	D+Q	−0.9 *3*	
1376.32 *3*	72 *1*	2072.95	2^+	696.578	2^+	M1+E2	+0.6 +*4*−*3*	
1378.32 *7*	52 *2*	2693.00	2^+	1314.712	4^+	E2		
1388.12 *3*	100	2084.71	0^+	696.578	2^+	E2		
1390.34 *14*	37 *1*	2901.53	2^+	1510.826	3^-			
1401.05 *6*	73 *1*	2715.79	(5,6)	1314.712	4^+			
1413.44 *3*	97 *1*	2110.032	4^+	696.578	2^+	E2		
1418.15 *3*	74 *4*	2732.89	4^+	1314.712	4^+	M1+E2	+0.4 *3*	
1450.91 *7*	79 *1*	2961.74	(2^+)	1510.826	3^-	(E1)		
1459.44 *14*	39 *1*	3020.53	$(4^+,3)$	1561.065	2^+			
1464.33 *4*	13 *2*	2779.02	3^-	1314.712	4^+	E1		
1482.26 *3*		2178.960	3^+	696.578	2^+	M1+E2	+0.8 +*9*−*4*	
1489.35 *3*	29 *1*	2186.029	1^-	696.578	2^+	E1		
1489.35 *4*		3000.19		1510.826	3^-			
1494.21 *10*	54 *2*	2808.79	6^+	1314.712	4^+	E2		
1515.08 *5*	41 *5*	2829.42	(2^+)	1314.712	4^+	E2		
1515.1 *5*		3026.3		1510.826	3^-			
1524.95 *24*	6 *1*	2839.59	2^+	1314.712	4^+	E2		
1543.1 *5*	17 *6*	3053.36	5^-	1510.826	3^-			
1553.74 *19*	12 *1*	2868.22	(3,2)	1314.712	4^+			
1561.14 *4*		1561.065	2^+	0	0^+	E2		
1565.35 *20*	25 *4*	3126.62	(3,2)	1561.065	2^+			
1573.04 *8*	74 *7*	2888.04	(5,4)	1314.712	4^+	D+Q	−1.4 +*9*−*4*	I_γ: from author′s private communication.
1586.47 *16*	7 *1*	2901.53	2^+	1314.712	4^+			
1598.91 *6*	7 *2*	2295.522	4^+	696.578	2^+	E2		
1608.73 *16*	71 *2*	3169.82	$1^{(+)}$	1561.065	2^+			
1631.61 *3*	100	2328.20	0^+	696.578	2^+	E2		
1636.1 *5*		3145.89		1510.826	3^-			
1653.44 *9*	25 *1*	2968.37	3^-	1314.712	4^+	E1		
1661.24 *18*		3222.32		1561.065	2^+			
1665.39 *6*	47 *1*	2980.11	4^+	1314.712	4^+	M1+E2	−1.2 +*5*−*17*	
1671.32 *2*	84 *8*	2986.06	4^+	1314.712	4^+			
1672.05 *4*	84 *1*	2368.74	2^+	696.578	2^+	M1+E2		δ: =+0.13 +*18*−*16*, value is compromised due to multiplet.
1691.3 *5*		3252.4		1561.065	2^+			
1712.0 *5*		3026.3		1314.712	4^+			
1731.2 *3*	21 *2*	3043.60	(3^+)	1314.712	4^+	(M1+E2)	+1.1 *10*	
1733.59 *8*	100	3048.31		1314.712	4^+			
1738.97 *13*	22 *7*	3053.36	5^-	1314.712	4^+			
1750.46 *16*	56 *7*	3065.18	(5,4)	1314.712	4^+			
1755.32 *4*	23 *1*	2451.82	4^+	696.578	2^+	E2		
1811.8 *3*	12 *3*	3126.62	(3,2)	1314.712	4^+			

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^{144}Nd(n,n′γ) 1998Hi09 (continued)

γ(^{144}Nd) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]
1821.7 *3*	50 *9*	3136.7		1314.712	4^+		
1831.15 *4*	32 *1*	2527.803	2^+	696.578	2^+	M1+E2	+0.6 *3*
1831.15 *4*		3145.89		1314.712	4^+		
1868.11 *4*	25 *1*	2564.375	(3^+)	696.578	2^+	D+Q	−0.03 *+9−10*
1885.76 *3*	100	2582.35	(3^+)	696.578	2^+	D+Q	+0.13 *+6−4*
1896.01 *3*	83 *1*	2592.55	2^+	696.578	2^+	M1+E2	+0.4 *+7−1*
1905.29 *6*	25 *1*	2601.73	4^+	696.578	2^+	E2	
1909.60 *3*	69 *1*	2606.05	3^-	696.578	2^+	E1	
1958.81 *6*	16 *2*	2655.55	1^+	696.578	2^+	M1+E2	
1979.06 *4*	100	2675.65	0^+	696.578	2^+	E2	
1996.4 *3*	4 *1*	2693.00	2^+	696.578	2^+		
2023.71 *3*	97 *1*	2720.31	2^+	696.578	2^+	M1+E2	−0.26 *+14−10*
2036.41 *7*	23 *3*	2732.89	4^+	696.578	2^+	E2	
2046.85 *7*		2743.29	0^+	696.578	2^+	E2	
2073.11 *6*	28 *1*	2072.95	2^+	0	0^+	E2	
2082.57 *7*	40 *2*	2779.02	3^-	696.578	2^+	E1	
2132.76 *8*	31 *3*	2829.42	(2^+)	696.578	2^+	M1+E2	+0.6 *+5−4*
2143.06 *5*	52 *1*	2839.59	2^+	696.578	2^+	M1+E2	−1.5 *+9−10*
2171.70 *14*	16 *1*	2868.22	(3,2)	696.578	2^+		
2186.10 *3*	71 *1*	2186.029	1^-	0	0^+	E1	
2205.13 *11*	13 *1*	2901.53	2^+	696.578	2^+	M1+E2	+1.1 *+9−20*
2254.71 *10*	41 *1*	2951.17	$3^{(+)}$	696.578	2^+	(M1+E2)	−2.1 *+12−9*
2271.86 *6*	75 *1*	2968.37	3^-	696.578	2^+	E1	
2278.83 *9*	60 *1*	2975.48	1	696.578	2^+		
2283.50 *10*	53 *1*	2980.11	4^+	696.578	2^+	E2	
2291.03 *18*	16 *2*	2986.06	4^+	696.578	2^+		
2304.5 *4*		3000.19		696.578	2^+		
2323.94 *10*	61 *1*	3020.53	$(4^+,3)$	696.578	2^+		
2332.46 *12*	100	3029.06		696.578	2^+		
2346.62 *11*	49 *1*	3043.60	(3^+)	696.578	2^+	(M1+E2)	−0.8 *+5−4*
2368.83 *4*	16 *1*	2368.74	2^+	0	0^+	E2	
2374.35 *7*	89 *1*	3070.95	(3^+)	696.578	2^+	(M1+E2)	+0.40 *+14−15*
2403.66 *11*	57 *1*	3100.31	2^+	696.578	2^+	M1+E2	+0.7 *7*
2408.01 *12*		3104.61		696.578	2^+		
2430.19 *11*	43 *4*	3126.62	(3,2)	696.578	2^+		
2450.1 *4*		3145.89		696.578	2^+		
2489.04 *19*	63 *4*	3185.61	(1,2)	696.578	2^+		
2506.0 *3*	100	3202.6	(3)	696.578	2^+		
2527.90 *3*	52 *1*	2527.803	2^+	0	0^+	E2	
2592.45 *10*	3 *1*	2592.55	2^+	0	0^+	E2	
2655.56 *3*	84 *2*	2655.55	1^+	0	0^+	M1	
2693.13 *7*	17 *1*	2693.00	2^+	0	0^+	E2	
2720.9 *6*	3 *1*	2720.31	2^+	0	0^+	E2	
2839.76 *8*	27 *1*	2839.59	2^+	0	0^+	E2	
2901.83 *8*	9 *1*	2901.53	2^+	0	0^+	E2	
2905.22 *3*	60 *1*	2905.16	$1^{(+)}$	0	0^+		
2961.6 *3*	21 *1*	2961.74	(2^+)	0	0^+	(E2)	
2975.54 *12*	40 *1*	2975.48	1	0	0^+		
3100.27 *9*	20 *1*	3100.31	2^+	0	0^+	E2	
3169.81 *24*	29 *2*	3169.82	$1^{(+)}$	0	0^+		
3186.45 *25*	12 *2*	3185.61	(1,2)	0	0^+		
3214.0 *5*		3214.0	(1,2)	0	0^+		
3245.5 *5*		3245.5	(1,2)	0	0^+		

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^{144}Nd(n,n′γ) 1998Hi09 (continued)

$\gamma(^{144}Nd)$ (continued)

† From $\gamma(\theta)$ comparisons with the calculated values using Hauser-Feshbach formalism for various ΔJ and δ.
‡ Relative photon branching ratios.
# Multiply placed.
@ Placement of transition in the level scheme is uncertain.

^{144}Nd(n,n′γ) 1998Hi09

Level Scheme

Intensities: Type not specified

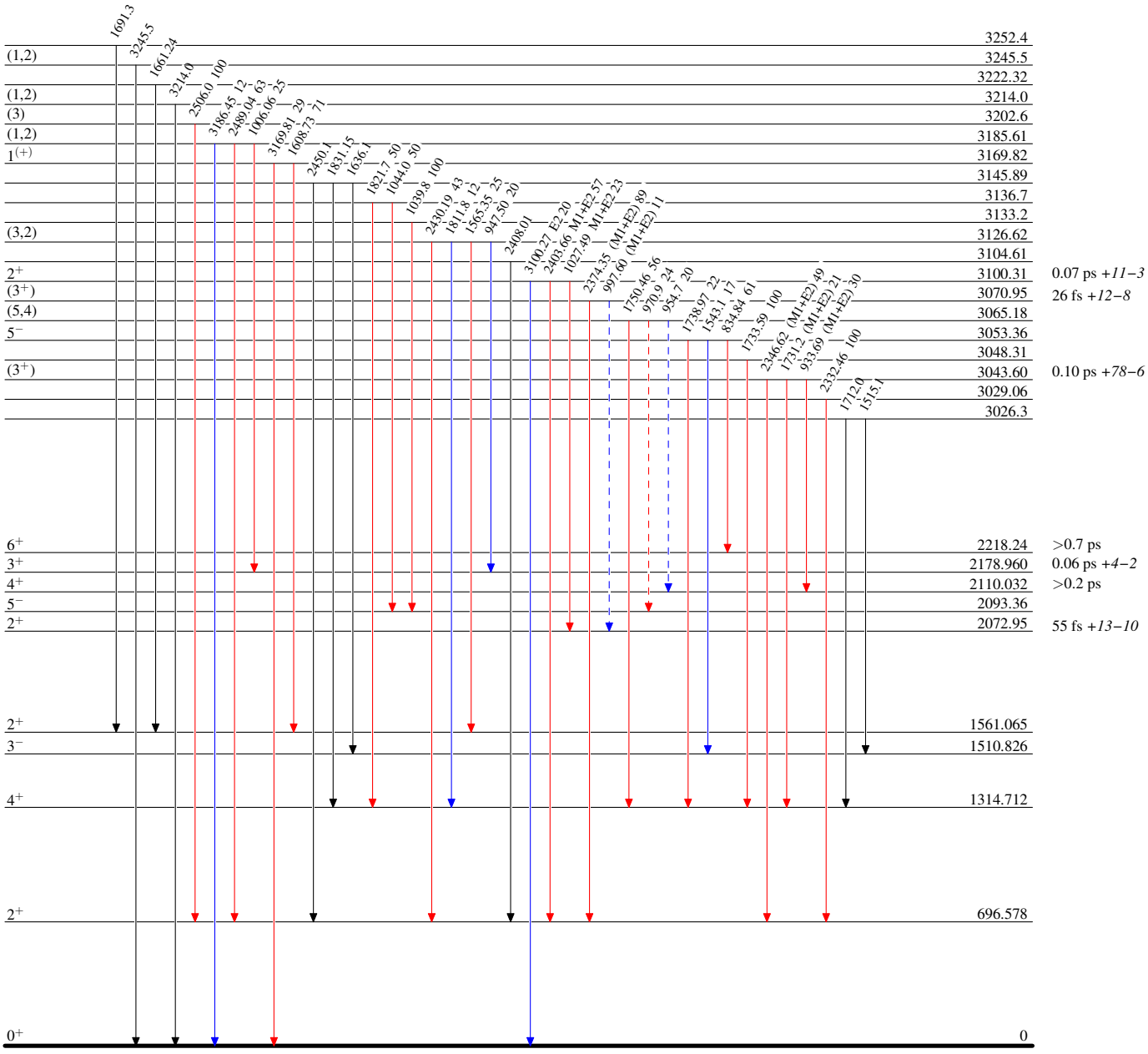
Legend

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

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

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

γ Decay (Uncertain)



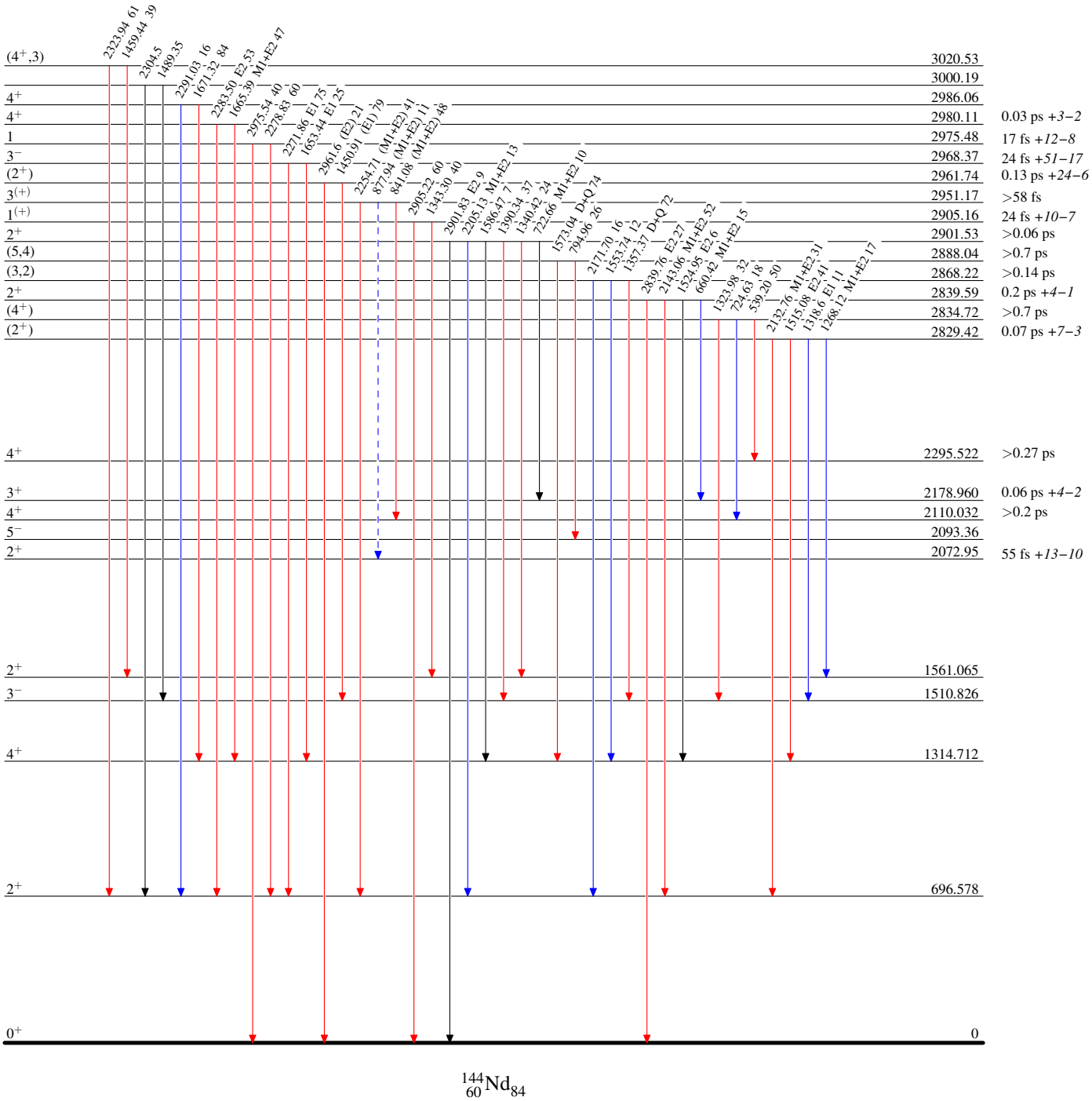
$^{144}_{60}Nd_{84}$

^{144}Nd(n,n′γ) 1998Hi09

Level Scheme (continued)

Intensities: Type not specified

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

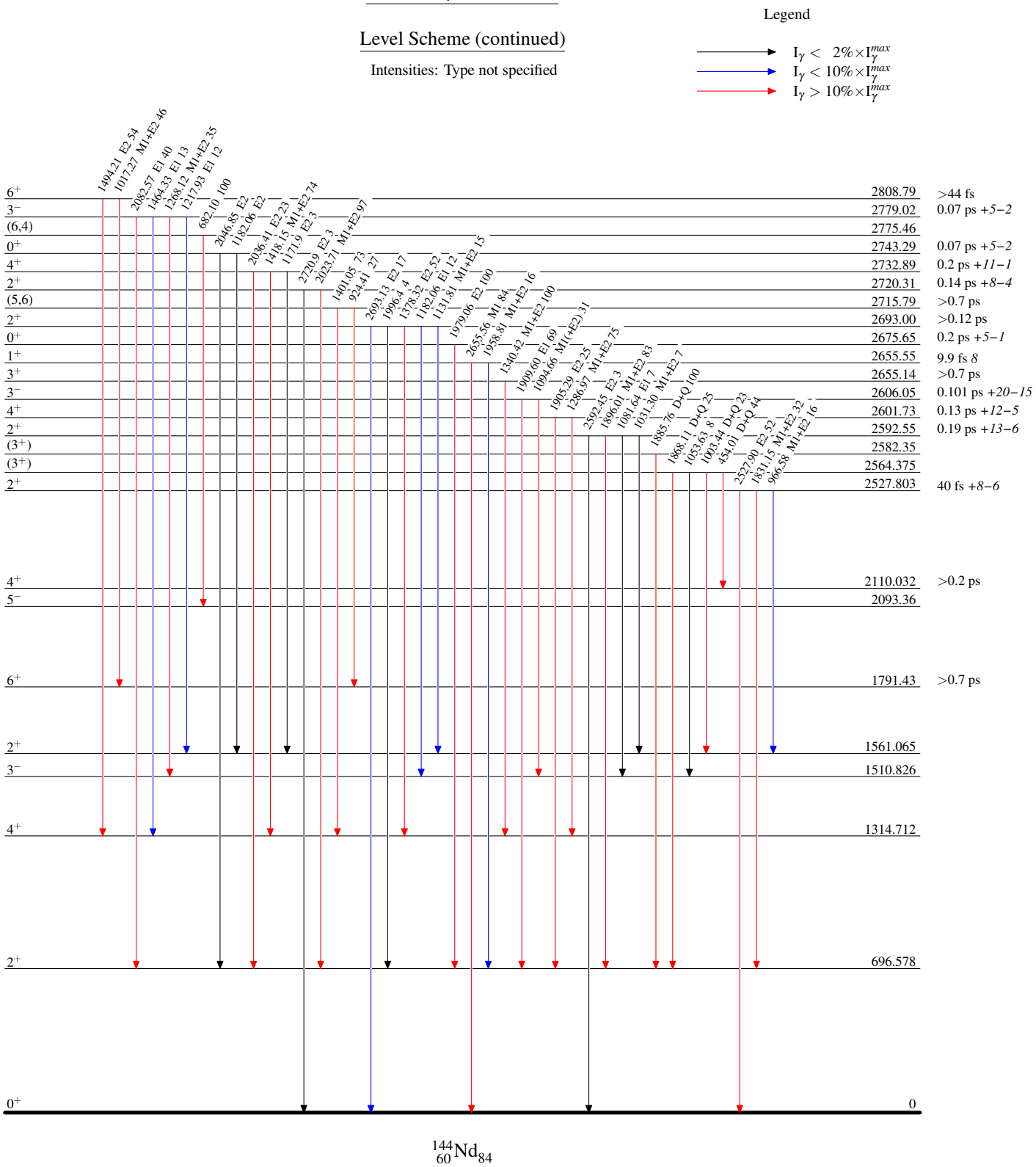


$^{144}_{60}Nd_{84}$

^{144}Nd(n,n′γ) 1998Hi09

Level Scheme (continued)

Intensities: Type not specified

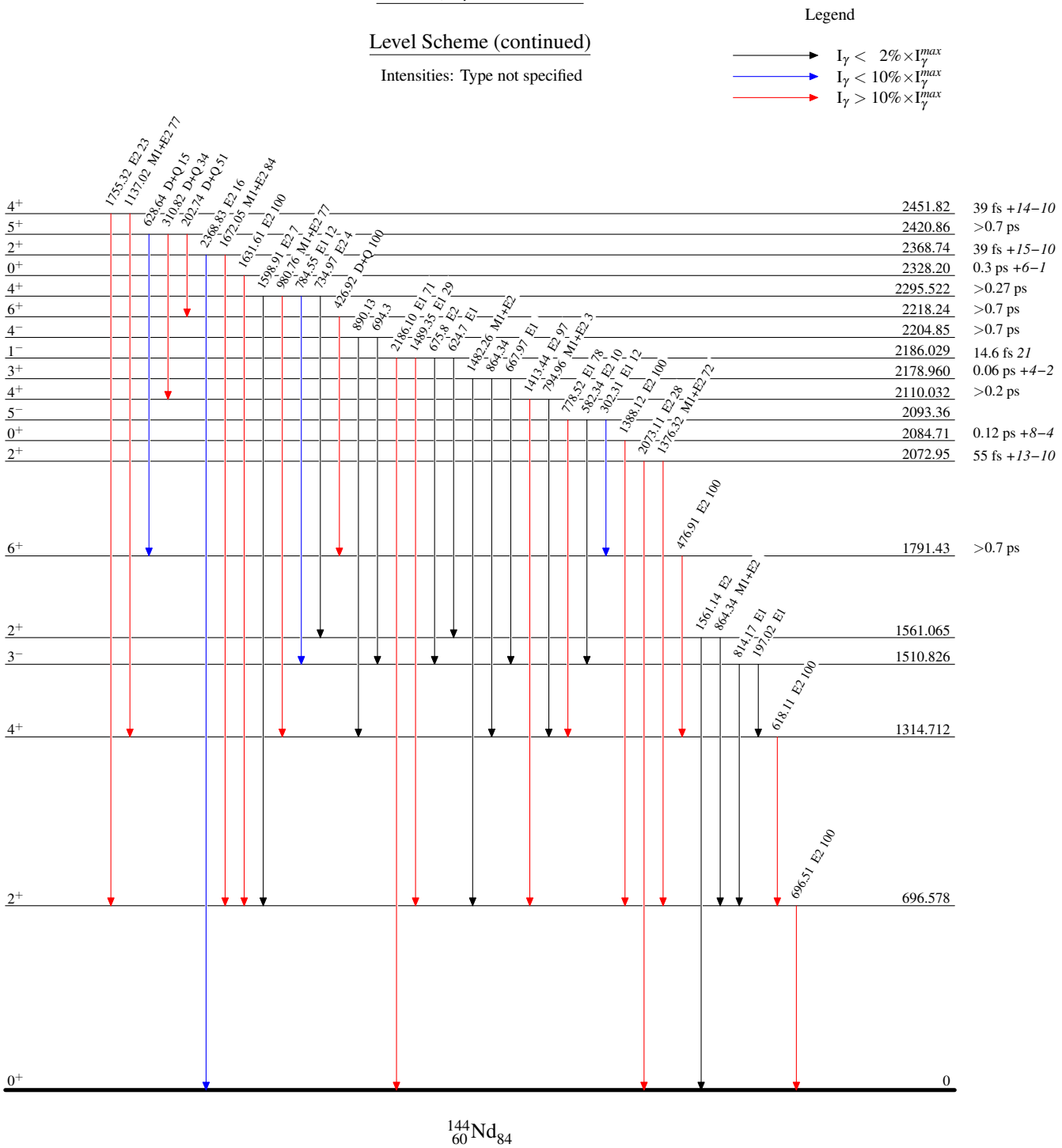


$^{144}_{60}Nd_{84}$

^{144}Nd(n,n′γ) 1998Hi09

Level Scheme (continued)

Intensities: Type not specified



$^{144}_{60}Nd_{84}$