^{148}Nd(γ,γ') 1990Pi04,1993Ma08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 117, 1 (2014)	1-Oct-2013

1990Pi04: Eγ(max)=4.1 MeV; measured Eγ, Iγ, $\sigma(\theta)$.
1993Ma08: Eγ(max)=4.1 MeV; measured Eγ, Iγ.

^{148}Nd Levels

All B(M1) are from 1993Ma08.

E(level)[†]	J$^\pi$[@]	T$_{1/2}$[a]	$\Gamma_{\gamma0}$ (meV)[&]	Comments
0.0	0$^+$			
(302)	2$^+$			
1023 *1*	1$^-$		5.3 *24*	
2153[‡] *1*	(1,2$^+$)	0.6 ps *4*	0.7 *4*	$\Gamma_{\gamma0}/\Gamma$=100% 30.
2376 *1*	1		4.8 *10*	B(M1)↑=0.09 *2* J=1.
2481[‡] *1*	1	0.14 ps *4*	3.2 *8*	$\Gamma_{\gamma0}/\Gamma$=100% 20.
2544[‡] *1*	(1$^-$)	0.25 ps *10*	1.8 *6*	$\Gamma_{\gamma0}/\Gamma$=100% 20.
2689[‡] *1*	1	86 fs *22*	5.3 *11*	$\Gamma_{\gamma0}/\Gamma$=100% 15.
2730 *1*	(1)		5.2 *15*	
2736[‡] *1*	1	0.12 ps *7*	3.8 *19*	$\Gamma_{\gamma0}/\Gamma$=100% 30.
2795[‡] *1*	(1,2$^+$)	0.25 ps *10*	1.8 *6*	$\Gamma_{\gamma0}/\Gamma$=100% 20.
2839[‡] *1*	1	0.08 ps *3*	5.5 *16*	$\Gamma_{\gamma0}/\Gamma$=100% 15.
2845[‡] *1*	(1)	0.27 ps *18*	1.7 *10*	$\Gamma_{\gamma0}/\Gamma$=100% 30.
2920[‡] *1*	1	0.08 ps *3*	5.8 *17*	$\Gamma_{\gamma0}/\Gamma$=100% 20.
2923 *1*	1		8.0 *21*	B(M1)↑=0.08 *2* J=1.
2982[‡] *1*	1	27 fs *11*	17 *6*	$\Gamma_{\gamma0}/\Gamma$=100% 20.
3002[‡] *1*	(1,2$^+$)	0.12 ps *6*	3.9 *18*	$\Gamma_{\gamma0}/\Gamma$=100% 30.
3092 *1*	1		30 *5*	
3113[‡#] *1*	1	0.11 ps *3*	4.0 *10*	$\Gamma_{\gamma0}/\Gamma$=100% 15.
3136[‡] *1*	1	54 fs *15*	8.4 *20*	$\Gamma_{\gamma0}/\Gamma$=100% 15.
3176[‡] *1*	(1)	57 fs *23*	8 *3*	$\Gamma_{\gamma0}/\Gamma$=100% 15.
3191[‡] *1*	(1)	0.13 ps *4*	3.6 *10*	$\Gamma_{\gamma0}/\Gamma$=100% 15.
3205[‡] *1*	(1,2$^+$)	0.16 ps *9*	2.8 *15*	$\Gamma_{\gamma0}/\Gamma$=100% 20.
3215 *1*	1		17 *3*	B(M1)↑=0.13 *2* J=1.
3265[‡] *1*	1	0.11 ps *4*	4.3 *16*	$\Gamma_{\gamma0}/\Gamma$=100% 20.
3281[‡] *1*	(1,2$^+$)	0.21 ps *15*	2.2 *15*	$\Gamma_{\gamma0}/\Gamma$=100% 30.
3341 *1*	1		29 *5*	B(M1)↑=0.20 *4* J=1.
3370 *1*	1		8.4 *22*	B(M1)↑=0.06 *2* J=1.
3378 *1*	1		9 *3*	
3405 *1*	1		11 *3*	B(M1)↑=0.07 *2* J=1.
3415 *1*	1		10 *9*	
3490[‡#] *1*	(1)	71 fs *23*	6.4 *18*	$\Gamma_{\gamma0}/\Gamma$=100% 15.
3528 *1*	(1,2$^+$)		7.3 *24*	B(M1)↑=0.04 *1*

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^{148}Nd(γ,γ') 1990Pi04,1993Ma08 (continued)

^{148}Nd Levels (continued)

E(level)[†]	J^{π}[@]	$T_{1/2}$[a]	$\Gamma_{\gamma 0}$ (meV)[&]	Comments
				J=(1,2$^+$) (1990Pi04).
3545 *1*	1		11 *3*	B(M1)↑=0.06 *2* J=1.
3597 *1*	(1)		12 *4*	B(M1)↑=0.07 *2* J=(1).
3689[‡] *1*	1	11 fs *3*	40 *9*	$\Gamma_{\gamma 0}/\Gamma$=100% 15.
3717 *1*	(1)		14 *4*	B(M1)↑=0.07 *2* J=(1).
3755[‡] *1*	(1)	0.07 ps *3*	6.2 *24*	$\Gamma_{\gamma 0}/\Gamma$=100% 20.
3771[‡] *1*	(1)	57 fs *24*	8 *3*	$\Gamma_{\gamma 0}/\Gamma$=100% 20.
3793[‡#] *1*	1		9 *3*	$\Gamma_{\gamma 0}/\Gamma$=100% 20 with $\Gamma_{\gamma 0}$=9 meV *3*; or, $\Gamma_{\gamma 0}/\Gamma$=66% 20 with $\Gamma_{\gamma 0}$=14 meV *6* (see the comment on the 3717 gamma). These correspond to $T_{1/2}$=51 fs *20* and 33 fs *17*, respectively.
3805[‡] *1*	1	35 fs *13*	13 *4*	$\Gamma_{\gamma 0}/\Gamma$=100% 20.
3826[‡] *1*	(1,2$^+$)	57 fs *24*	8 *3*	$\Gamma_{\gamma 0}/\Gamma$=100% 20.
3861 *1*	1		56 *12*	B(M1)↑=0.25 *5* J=1.

[†] From 1990Pi04.
[‡] Levels with no detectable branching to other levels.
[#] Decay properties of this level uncertain; there could be possible branching to the first excited 2$^+$ level.
[@] From Adopted Levels; supported by $\sigma(\theta)$ from this data set. These assignments are given in comments.
[&] Calculated for pure dipole radiation using the experimental branching ratio to the first excited 2$^+$ state given in comments.
[a] From $\Gamma_{\gamma 0}/\Gamma$ and $\Gamma_{\gamma 0}$.

$\gamma(^{148}$Nd)

E_i(level)	J_i^{π}	E_{γ}[†]	I_{γ}[‡]	E_f	J_f^{π}	E_i(level)	J_i^{π}	E_{γ}[†]	I_{γ}[‡]	E_f	J_f^{π}
1023	1$^-$	721 *1*	81 *30*	302?	2$^+$	3136	1	3136 *1*	100	0.0	0$^+$
		1023 *1*	100	0.0	0$^+$	3176	(1)	3176 *1*	100	0.0	0$^+$
2153	(1,2$^+$)	2153 *1*	100	0.0	0$^+$	3191	(1)	3191 *1*	100	0.0	0$^+$
2376	1	2074 *1*	65 *20*	302?	2$^+$	3205	(1,2$^+$)	3205 *1*	100	0.0	0$^+$
		2376 *1*	100	0.0	0$^+$	3215	1	2913 *1*	24 *9*	302?	2$^+$
2481	1	2481 *1*	100	0.0	0$^+$			3215 *1*	100	0.0	0$^+$
2544	(1$^-$)	2544 *1*	100	0.0	0$^+$	3265	1	3265 *1*	100	0.0	0$^+$
2689	1	2689 *1*	100	0.0	0$^+$	3281	(1,2$^+$)	3281 *1*	100	0.0	0$^+$
2730	(1)	2428 *1*	91 *26*	302?	2$^+$	3341	1	3039 *1*	45 *10*	302?	2$^+$
		2730 *1*	100	0.0	0$^+$			3341 *1*	100	0.0	0$^+$
2736	1	2736 *1*	100	0.0	0$^+$	3370	1	3068 *1*	53 *19*	302?	2$^+$
2795	(1,2$^+$)	2795 *1*	100	0.0	0$^+$			3370 *1*	100	0.0	0$^+$
2839	1	2839 *1*	100	0.0	0$^+$	3378	1	3076 *1*	77 *23*	302?	2$^+$
2845	(1)	2845 *1*	100	0.0	0$^+$			3378 *1*	100	0.0	0$^+$
2920	1	2920 *1*	100	0.0	0$^+$	3405	1	3103 *1*	51 *14*	302?	2$^+$
2923	1	2621 *1*	61 *18*	302?	2$^+$			3405 *1*	100	0.0	0$^+$
		2923 *1*	100	0.0	0$^+$	3415	1	3113 *1*	100	302?	2$^+$
2982	1	2982 *1*	100	0.0	0$^+$			3415 *1*	52 *31*	0.0	0$^+$
3002	(1,2$^+$)	3002 *1*	100	0.0	0$^+$	3490	(1)	3490 *1*	100	0.0	0$^+$
3092	1	2790 *1*	80 *6*	302?	2$^+$	3528	(1,2$^+$)	3226 *1*	61 *28*	302?	2$^+$
		3092 *1*	100	0.0	0$^+$			3528 *1*	100	0.0	0$^+$
3113	1	3113 *1*	100	0.0	0$^+$	3545	1	3243 *1*	52 *31*	302?	2$^+$

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^{148}Nd(γ,γ') 1990Pi04,1993Ma08 (continued)

$\gamma(^{148}Nd)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Comments
3545	1	3545 *1*	100	0.0	0^+	
3597	(1)	3295 *1*	56 *24*	302?	2^+	
		3597 *1*	100	0.0	0^+	
3689	1	3689 *1*	100	0.0	0^+	
3717	(1)	3415 *1*		302?	2^+	
		3717 *1*		0.0	0^+	$I\gamma(3415)/I\gamma(3717)=0.5$ *4*, and $\Gamma_{\gamma 0}=14$ meV *4* assuming two separate levels at 3717 and 3415 with a branching to the first excited 2^+ level; or $I\gamma(3415)/I\gamma(3717)=1.5$ *3*, and $\Gamma_{\gamma 0}=22$ meV *6* assuming one level at 3717 with branching to the first excited 2^+ level and a level at 3113 without such branching.
3755	(1)	3755 *1*	100	0.0	0^+	
3771	(1)	3771 *1*	100	0.0	0^+	
3793	1	3793 *1*	100	0.0	0^+	
3805	1	3805 *1*	100	0.0	0^+	
3826	$(1,2^+)$	3826 *1*	100	0.0	0^+	
3861	1	3559 *1*	15 *6*	302?	2^+	
		3861 *1*	100	0.0	0^+	

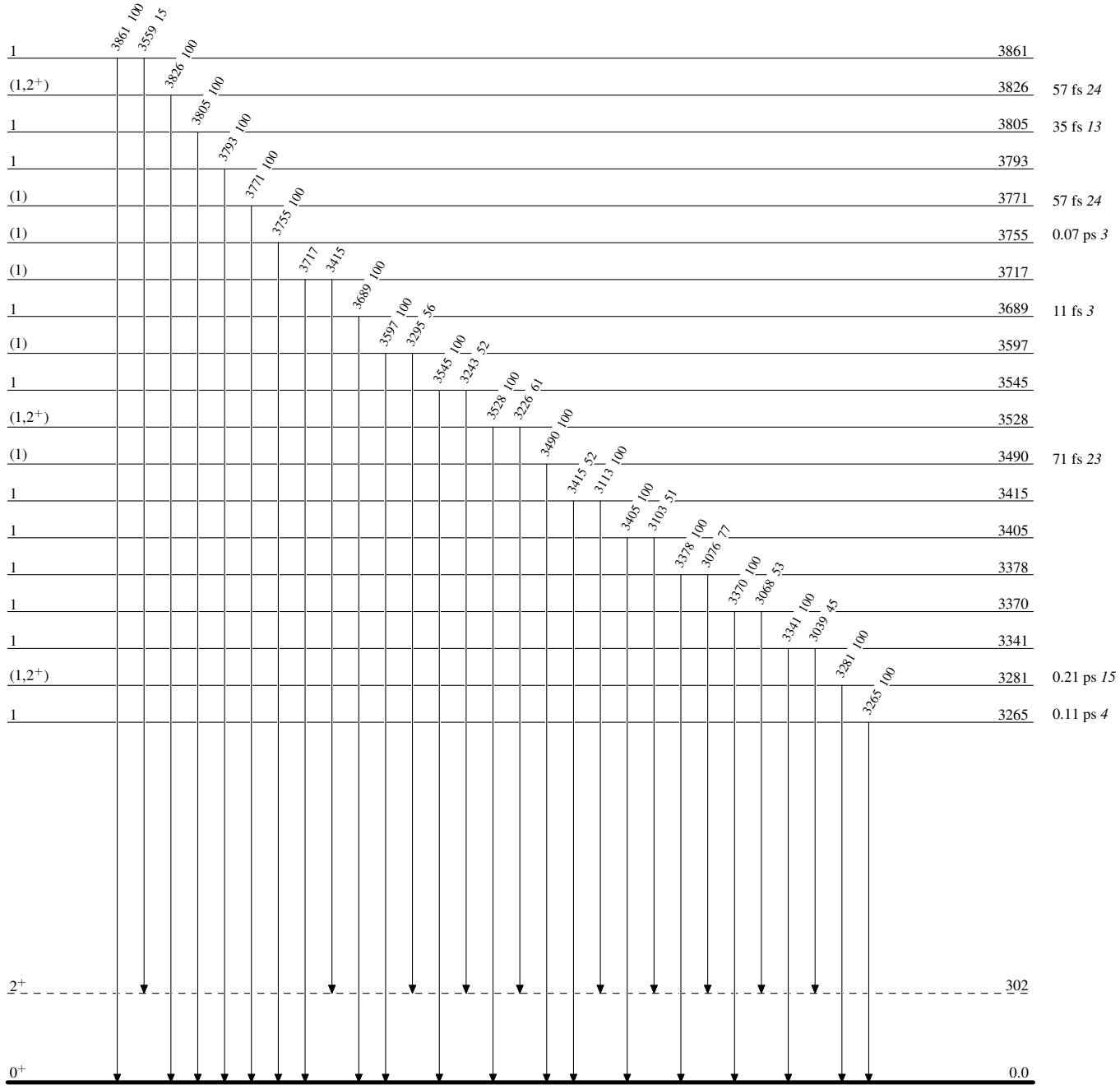
[†] Deduced from level energies.

[‡] Relative photon branching from each level obtained from the branching ratios (1990Pi04) which have a $(E\gamma_0/E\gamma_2)^3$ factor in their definition.

^{148}Nd(γ,γ′) 1990Pi04,1993Ma08

Level Scheme

Intensities: Relative photon branching from each level

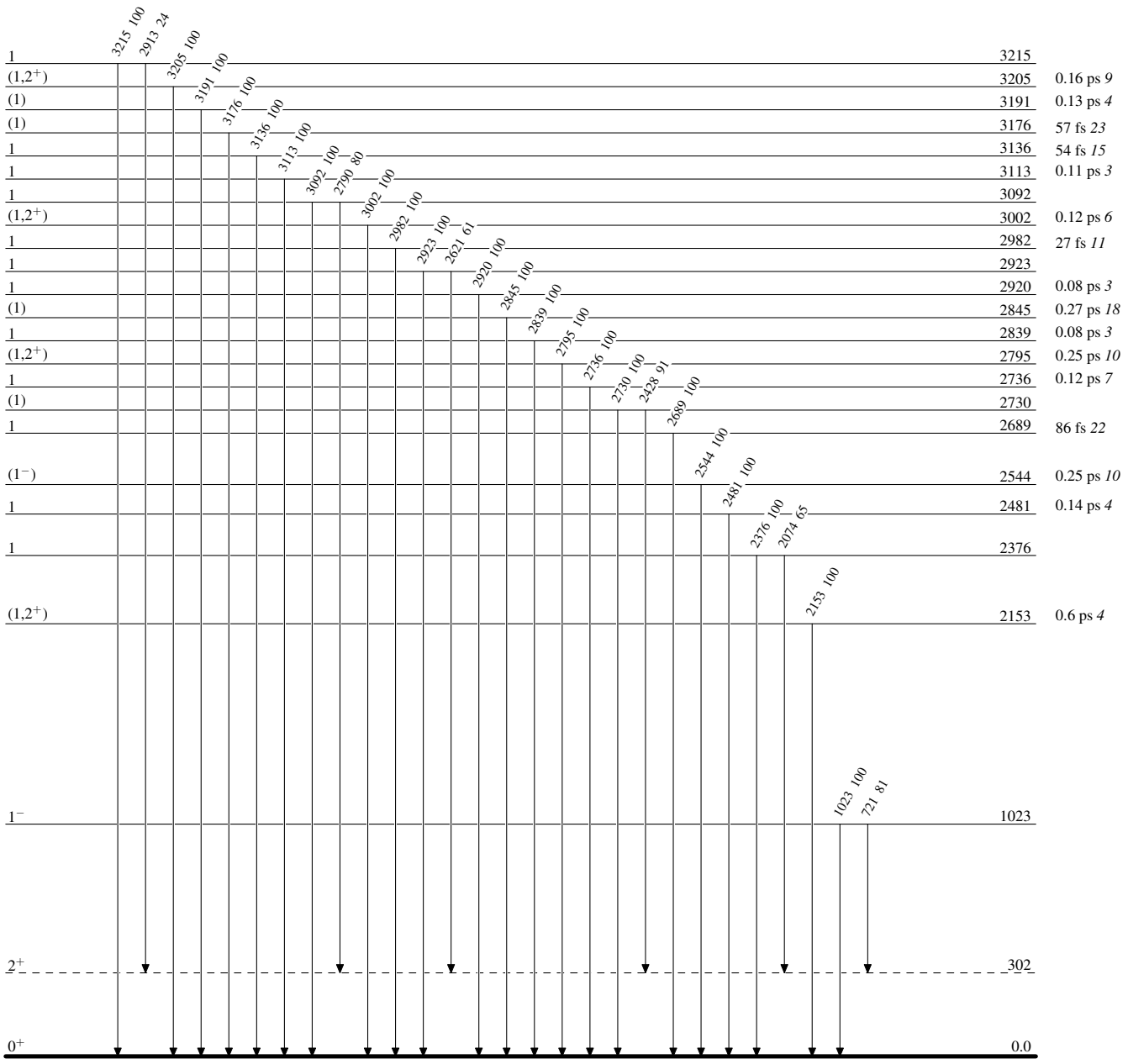


$^{148}_{60}Nd_{88}$

^{148}Nd(γ,γ′) 1990Pi04,1993Ma08

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{148}_{60}Nd_{88}$