^{148}Nd(n,γ),(n,n):resonances 2018MuZY

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

2018MuZY: evaluation of neutron resonances.
1977MuZC: energies and parameters measured for 80 resonances in the range of E(n)=2710 eV to 7978 eV.
1969Al09: data for three resonances at 155.1, 286.2 and 714.9 eV.
1968Ka28: energies and widths of 29 resonances measured in the range of E(n)=0.155 to 8.78 keV.
Resonance energies, resonance strengths, widths (Γ, Γ_n and Γ_γ), and L-values are from 2018MuZY. Spins of 1/2 are from L=0 (s-wave resonances) in 2018MuZY. J^π=1/2$^-$,3/2$^-$, and in some cases (1/2$^+$) are assigned by evaluators from L=1 (p-wave resonances) and L=(0) in 2018MuZY.

^{149}Nd Levels

S(n)(^{149}Nd)=5038.79 *7* (2021Wa16).

E(level)‡	J$^\pi$	Γ	L	g$\Gamma_n\Gamma_\gamma/\Gamma$ (meV)†	Comments
S(n)-0.434?	1/2$^+$		0		E(level): fictitious resonance to fit the low-energy section of the time-of-flight spectrum.
S(n)+0.0949 *1*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=0.55 meV *4*, Γ_γ=46 meV *5*.
S(n)+0.1557 *1*	1/2$^+$	1.93 eV *10*	0		gΓ_n=1.85 eV *10*, Γ_γ=43.4 meV *16*.
S(n)+0.1724 *2*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=0.44 meV *3*, Γ_γ=45 meV *5*.
S(n)+0.1844 *2*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=0.07 meV *5*, Γ_γ=45 meV *5*.
S(n)+0.2529 *2*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=0.39 meV *10*, Γ_γ=45 meV *5*.
S(n)+0.2876 *3*	1/2$^+$	3.09 eV *10*	0		gΓ_n=3.04 eV *10*, Γ_γ=53 meV *6*.
S(n)+0.3983 *4*	(1/2$^+$)		(0)		gΓ_n=350 meV *20*, Γ_γ=59 meV *3*.
S(n)+0.5140 *5*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=1.9 meV *3*.
S(n)+0.6285 *6*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=0.85 meV *25*.
S(n)+0.7149 *8*	1/2$^+$	2.42 eV *60*	0		gΓ_n=2.35 eV *5*.
S(n)+0.7793 *8*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=7.5 meV *15*.
S(n)+0.8719 *9*	(1/2$^+$)	0.345 eV *30*	(0)		gΓ_n=315 meV *10*.
S(n)+0.9050 *9*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=6.9 meV *5*.
S(n)+1.0541 *10*	1/2$^+$		0		gΓ_n=2.53 eV *15*.
S(n)+1.1762 *12*	1/2$^+$		0		gΓ_n=2.65 eV *15*.
S(n)+1.2088 *20*	(1/2$^+$)		(0)		gΓ_n=36.4 meV *25*.
S(n)+1.244 *2*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=8.0 meV *5*.
S(n)+1.299 *2*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=3.3 meV *10*.
S(n)+1.3443 *15*	1/2$^+$		0		gΓ_n=1.82 eV *11*.
S(n)+1.388 *2*	(1/2$^-$,3/2$^-$)		(1)		gΓ_n=8.9 meV *15*.
S(n)+1.5335 *15*	1/2$^+$		0		gΓ_n=3.69 eV *15*.
S(n)+1.7937 *20*	(1/2$^+$)		(0)		gΓ_n=112.5 meV *75*.
S(n)+2.0283 *20*	(1/2$^+$)		(0)		gΓ_n=505 meV *25*.
S(n)+2.1777 *20*	1/2$^+$		0		gΓ_n=5.88 eV *25*.
S(n)+2.3769 *20*	1/2$^+$		0		gΓ_n=3.40 eV *15*.
S(n)+2.4295 *20*	1/2$^+$		0		gΓ_n=2.05 eV *15*.
S(n)+2.5623 *20*	1/2$^+$		0		gΓ_n=9.0 eV *10*.
S(n)+2.710 *3*	1/2$^-$,3/2$^-$		1	14 *2*	gΓ_n=22 meV *8*.
S(n)+2.772 *3*	1/2$^-$,3/2$^-$		1	11 *2*	gΓ_n=12 meV *3*.
S(n)+2.784 *3*	1/2$^+$		0	36 *4*	gΓ_n=1.21 eV *5*, Γ_γ=37 meV *4*.
S(n)+2.989 *3*	1/2$^+$		0	36 *4*	gΓ_n=2.17 eV *10*, Γ_γ=36 meV *4*.
S(n)+3.045 *3*	1/2$^-$,3/2$^-$		1	2 *1*	gΓ_n=2 meV *1*.
S(n)+3.065 *3*	1/2$^-$,3/2$^-$		1	6 *1*	gΓ_n=7 meV *2*.
S(n)+3.121 *3*	(1/2$^-$,3/2$^-$)		(1)	24 *3*	gΓ_n=60 meV.
S(n)+3.170 *3*	(1/2$^-$,3/2$^-$)		(1)	20 *2*	gΓ_n=40 meV.
S(n)+3.355 *3*	1/2$^-$,3/2$^-$		1	12 *2*	gΓ_n=17 meV *5*.

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^{148}Nd(n,γ),(n,n):resonances 2018MuZY (continued)

^{149}Nd Levels (continued)

E(level)‡	Jπ	L	gΓnΓγ/Γ (meV)†	Comments
S(n)+3.442 *3*	1/2−,3/2−	1	7 *1*	gΓn=8 meV *1*.
S(n)+3.484 *3*	1/2+	0	30 *3*	gΓn=665 meV *30*, Γγ=31 meV *5*.
S(n)+3.612 *3*	1/2−,3/2−	1	6 *1*	gΓn=7 meV *1*.
S(n)+3.645 *3*	(1/2+)	(0)	28 *3*	gΓn=93 meV.
S(n)+3.769 *3*	1/2−,3/2−	1	4 *1*	gΓn=5 meV *1*.
S(n)+3.812 *3*	1/2+	0	29 *3*	gΓn=430 meV *30*.
S(n)+3.837 *3*	1/2−,3/2−	1	9 *1*	gΓn=12 meV *3*.
S(n)+3.891 *3*	1/2+	0	34 *4*	gΓn=19.15 eV *75*, Γγ=35 meV *5*.
S(n)+3.948 *3*	1/2−,3/2−	1	4 *1*	gΓn=4 meV *1*.
S(n)+3.972 *3*	1/2−,3/2−	1	3 *1*	gΓn=4 meV *1*.
S(n)+4.027 *3*	1/2−,3/2−	1	9 *1*	gΓn=12 meV *1*.
S(n)+4.073 *4*	1/2+	0	86 *7*	gΓn=17.55 eV *40*, Γγ=67 meV *7*.
S(n)+4.145 *4*	1/2−,3/2−	1	11 *1*	gΓn=15 meV *5*.
S(n)+4.267 *5*	1/2+	0	46 *5*	gΓn=7.20 eV *40*, Γγ=46 meV *5*.
S(n)+4.307 *5*	1/2−,3/2−	1	11 *2*	gΓn=16 meV *5*.
S(n)+4.403 *5*	1/2−,3/2−	1	7 *1*	gΓn=8 meV *1*.
S(n)+4.420 *5*	1/2+	0	47 *6*	gΓn=1.490 eV *75*, Γγ=47 meV *5*.
S(n)+4.442 *5*	1/2−,3/2−	1	7 *1*	gΓn=8 meV *1*.
S(n)+4.522 *5*	1/2−,3/2−	1	3 *1*	gΓn=4 meV *1*.
S(n)+4.565 *5*	1/2−,3/2−	1	2 *1*	gΓn=2 meV *1*.
S(n)+4.619 *5*	1/2−,3/2−	1	11 *2*	gΓn=15 meV *1*.
S(n)+4.653 *6*	1/2+	0	38 *4*	gΓn=4.87 eV *25*, Γγ=38 meV *4*.
S(n)+4.691 *6*	1/2+	0	35 *4*	gΓn=900 meV *50*, Γγ=37 meV *5*.
S(n)+4.807 *6*	1/2−,3/2−	1	3 *1*	gΓn=3 meV *1*.
S(n)+4.838 *6*	(3/2−)	(1)	23 *2*	gΓn=45.0 meV *75*, Γγ=23.5 meV *70*.
S(n)+5.041 *6*			19 *2*	gΓn=36 meV.
S(n)+5.068 *6*			22 *2*	gΓn=49 meV.
S(n)+5.222 *6*	1/2−,3/2−	1	12 *2*	gΓn=18 meV *7*.
S(n)+5.292 *6*	1/2+	0	41 *4*	gΓn=3.78 eV *15*, Γγ=41 meV *4*.
S(n)+5.302 *6*			16 *2*	gΓn=27 meV.
S(n)+5.401 *6*			23 *3*	gΓn=54 meV.
S(n)+5.460 *6*	1/2+	0	32 *4*	gΓn=1.59 eV *15*, Γγ=32 meV *4*.
S(n)+5.632 *6*	1/2−,3/2−	1	5 *1*	gΓn=6 meV *1*.
S(n)+5.669 *6*	1/2+	0	81 *8*	gΓn=4.0 eV *10*, Γγ=83 meV *8*.
S(n)+5.788 *6*	1/2+	0	30 *4*	gΓn=255 meV *90*, Γγ=34 meV *6*.
S(n)+5.933 *6*			23 *3*	gΓn=54 meV.
S(n)+5.964 *6*			15 *2*	gΓn=24 meV.
S(n)+6.068 *6*	1/2−,3/2−	1	6 *2*	gΓn=7 meV *2*.
S(n)+6.093 *6*	1/2+	0	45 *5*	gΓn=5.36 eV *25*, Γγ=46 meV *6*.
S(n)+6.133 *6*	1/2−,3/2−	1	5 *2*	gΓn=6 meV *2*.
S(n)+6.165 *6*	1/2−,3/2−	1	4 *2*	gΓn=4 meV *2*.
S(n)+6.213 *6*	1/2−,3/2−	1	3 *1*	gΓn=4 meV *2*.
S(n)+6.313 *6*	1/2−,3/2−	1	10 *2*	gΓn=14 meV *4*.
S(n)+6.343 *6*	(1/2−,3/2−)	(1)	23 *3*	gΓn=54 meV.
S(n)+6.415 *6*	1/2−,3/2−	1	9 *2*	gΓn=12 meV *3*.
S(n)+6.460 *6*	1/2−,3/2−	1	5 *2*	gΓn=6 meV *2*.
S(n)+6.490 *6*	1/2+	0	37 *4*	gΓn=0.50 eV *10*, Γγ=40 meV *5*.
S(n)+6.545 *6*	1/2−,3/2−	1	2 *2*	gΓn=2 meV *2*.
S(n)+6.620 *6*	1/2−,3/2−	1	12 *2*	gΓn=18 meV *5*.
S(n)+6.640 *6*	1/2+	0	39 *5*	gΓn=3.67 eV *15*, Γγ=39 meV *5*.
S(n)+6.763 *6*			24 *3*	gΓn=60 meV.
S(n)+6.783 *6*			19 *3*	gΓn=36 meV.
S(n)+6.860 *6*	1/2−,3/2−	1	12 *2*	gΓn=17 meV *4*.
S(n)+6.925 *6*	1/2−,3/2−	1	3 *2*	gΓn=3 meV *2*.
S(n)+6.968 *6*	1/2−,3/2−	1	6 *2*	gΓn=8 meV *3*.
S(n)+7.058 *7*	1/2+	0	50 *7*	gΓn=14.09 eV *50*, Γγ=50 meV *7*.

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^{148}Nd(n,γ),(n,n):resonances 2018MuZY (continued)

^{149}Nd Levels (continued)

E(level)[‡]	J$^{\pi}$	L	g$\Gamma_n\Gamma_\gamma/\Gamma$ (meV)[†]	Comments
S(n)+7.100 *7*			21 *3*	gΓ_n=44 meV.
S(n)+7.133 *7*	1/2$^-$,3/2$^-$	1	13 *2*	gΓ_n=20 meV *6*.
S(n)+7.195 *7*			26 *3*	gΓ_n=74 meV.
S(n)+7.240 *7*	1/2$^-$,3/2$^-$	1	11 *3*	gΓ_n=18 meV *5*.
S(n)+7.303 *8*	1/2$^+$	0	80 *9*	gΓ_n=6.0 eV *10*, Γ_γ=82 meV *9*.
S(n)+7.370 *8*	1/2$^+$	0	47 *5*	gΓ_n=2.81 eV *20*, Γ_γ=48 meV *5*.
S(n)+7.505 *8*			22 *3*	gΓ_n=49 meV.
S(n)+7.545 *8*			22 *4*	gΓ_n=49 meV.
S(n)+7.586 *8*			32 *4*	gΓ_n=160 meV.
S(n)+7.668 *8*	1/2$^+$	0	67 *8*	gΓ_n=14.00 eV *50*, Γ_γ=67 meV *8*.
S(n)+7.710 *8*	1/2$^-$,3/2$^-$	1	8 *2*	gΓ_n=11 meV *4*.
S(n)+7.798 *8*			18 *3*	gΓ_n=3.3 eV.
S(n)+7.893 *8*	1/2$^-$,3/2$^-$	1	6 *2*	gΓ_n=8 meV *3*.
S(n)+7.950 *8*			26 *4*	gΓ_n=74 meV.
S(n)+7.978 *8*			28 *4*	gΓ_n=93 meV.
S(n)+8.646 *9*	1/2$^+$	0		gΓ_n=24.3 eV *10*.
S(n)+8.774 *9*	(1/2$^+$)	(0)		gΓ_n=7.00 eV *35*.
S(n)+9.049 *9*	(1/2$^+$)	(0)		gΓ_n=8.30 eV *40*.
S(n)+9.390 *9*	(1/2$^+$)	(0)		gΓ_n=4.76 eV *35*.
S(n)+9.600 *10*	(1/2$^+$)	(0)		gΓ_n=1.71 eV *25*.
S(n)+9.676 *10*	(1/2$^+$)	(0)		gΓ_n=3.21 eV *30*.
S(n)+9.973 *10*	(1/2$^+$)	(0)		gΓ_n=3.70 eV *30*.
S(n)+10.081 *10*	(1/2$^+$)	(0)		gΓ_n=2.25 eV *25*.
S(n)+10.279 *10*	(1/2$^+$)	(0)		gΓ_n=2.01 eV *25*.
S(n)+10.409 *11*	(1/2$^+$)	(0)		gΓ_n=3.44 eV *30*.
S(n)+10.852 *10*	(1/2$^+$)	(0)		gΓ_n=9.28 eV *50*.
S(n)+10.905 *12*	(1/2$^+$)	(0)		gΓ_n=4.78 eV *50*.
S(n)+11.125 *12*	(1/2$^+$)	(0)		gΓ_n=1.55 eV *30*.
S(n)+11.347 *12*	(1/2$^+$)	(0)		gΓ_n=2.60 eV *30*.
S(n)+11.462 *12*	(1/2$^+$)	(0)		gΓ_n=5.35 eV *50*.
S(n)+11.924 *12*	(1/2$^+$)	(0)		gΓ_n=3.13 eV *30*.

[†] Resonance strength.
[‡] Resonance energies are in the lab system.