^{31}P(n,n),(n,γ),(n,X):res 2018MuZY

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 201,1 (2025)	31-Oct-2024

Target J^π(^{31}P g.s.)=1/2$^+$.

All resonance parameters taken from 2018MuZY evaluation, unless otherwise stated.

2018MuZY: evaluation of neutron resonance energies, J^π values, width parameters, and resonance strengths.

2000Ab40: E(n)=0.75-11.3 MeV neutrons at the Los Alamos National Laboratory. Measured neutron spectra by time-of-flight method by measuring the attenuation of a neutron beam as it passed through thin targets. Deduced total neutron cross sections. Estimated level widths using autocorrelation, Fourier analysis and microscopic model calculations.

1985Ma33: E=26.8-436 keV at ORELA, measured σ(E), deduced stellar reaction σ, resonance strengths. Plastic and ^{6}Li glass scintillator detectors.

1971Ny02: E=26.8 keV from the ^{7}Li(p,n)^{7}Be reaction, produced using the Van de Graaff accelerator at Research Institute of National Defence, Stockholm. Measured σ(E).

1970Lu15: E=27 keV from the pulsed Van de Graaff accelerator at Studsvik. Measured σ(E, Eγ).

Additional information 1.

^{32}P Levels

E(level)[†]	J$^\pi$	Γ	L	g$\Gamma_n\Gamma_\gamma/\Gamma$ (EV)	Comments
7929.9?	0$^+$		0		E(level): fictitious level, not included in Adopted Levels. E(n)(lab)=−5.9 keV, Γ_γ=2 eV.
7961.56 *4*	[−]	<0.003 keV	[1]	0.455 *5*	E(n)(lab)=26.75 keV *2*, 2gΓ_n<4.5 eV, Γ_γ=0.610 eV *7*.
8017.0 *1*	(0$^-$)	<0.03 keV	[1]	0.141 *8*	E(n)(lab)=84.0 keV *1*, 2gΓ_n<4.5 eV, Γ_γ=0.56 eV *3*.
8025.47 *11*	[−]	<0.03 keV	[1]	0.575 *20*	E(n)(lab)=92.74 keV *10*, 2gΓ_n<4.5 eV, Γ_γ=0.77 eV *3*.
8037.45 *11*	[−]	<0.04 keV	[1]	0.649 *25*	E(n)(lab)=105.11 keV *10*, 2gΓ_n<0.060 keV, Γ_γ=0.87 eV *3*.
8039.8 *1*	[−]	<0.04 keV	[1]	0.73 *3*	E(n)(lab)=107.5 keV *1*, 2gΓ_n<0.060 keV, Γ_γ=0.97eV *4*.
8045.5 *1*	[−]	<0.04 keV	[1]	0.488 *24*	E(n)(lab)=113.4 keV *1*, 2gΓ_n<0.060 keV, Γ_γ=0.65 eV *3*.
8078.6 *1*	(0$^-$)	<0.06 keV	[1]	0.238 *21*	E(n)(lab)=147.6 keV *1*, 2gΓ_n<0.030 keV, Γ_γ=0.840 eV *14*.
8086.8 *1*	(1$^-$)	<0.06 keV	[1]	0.50 *4*	E(n)(lab)=156.1 keV *1*, 2gΓ_n<0.090 keV, Γ_γ=0.66 eV *6*.
8087.6 *1*	1$^+$	2.03 keV *14*	0	2.50 *21*	E(n)(lab)=156.9 keV *1*, 2gΓ_n=3.05 keV *21*, Γ_γ=3.3 eV *3*.
8092.1 *2*	(0$^+$)	1.7 keV *6*	[0]	0.35 *9*	E(n)(lab)=161.5 keV *2*, 2gΓ_n=0.85 keV *30*, Γ_γ=1.4 eV *4*.
8113.4 *2*	[1$^+$]	1.3 keV *2*	[0]	0.92 *10*	E(n)(lab)=183.5 keV *2*, 2gΓ_n=1.95 keV *30*, Γ_γ=1.22 eV *13*.
8148.5 *2*	(1$^+$)	0.91 keV *7*	[0]	3.10 *14*	E(n)(lab)=219.8 keV *2*, 2gΓ_n=1.37 keV *11*, Γ_γ=4.2 eV *4*.
8153.4 *2*	(1$^-$)	<0.1 keV	[1]	1.17 *8*	E(n)(lab)=224.8 keV *2*, 2gΓ_n<0.150 keV, Γ_γ=1.56 eV *11*.
8156.7 *2*	(1$^-$)	0.65 keV *7*	[1]	1.16 *9*	E(n)(lab)=228.2 keV *2*, 2gΓ_n=0.98 keV *11*, Γ_γ=1.55 eV *12*.
8166.3 *2*	(1$^+$)	0.41 keV *3*	[0]	1.63 *9*	E(n)(lab)=238.2 keV *2*, 2gΓ_n=0.62 keV *5*, Γ_γ=2.17 eV *24*.
8182.4 *2*	(1$^+$)	0.21 keV *2*	[0]	2.15 *12*	E(n)(lab)=254.8 keV *2*, 2gΓ_n=0.32 keV *3*, Γ_γ=2.9 eV *3*.
8196.5 *2*	(1$^-$)	0.31 keV *3*	[1]	1.31 *9*	E(n)(lab)=269.3 keV *2*, 2gΓ_n=0.47 keV *5*, Γ_γ=1.75 eV *12*.
8201.6 *2*	(1$^-$)	<0.13 keV	[1]	1.11 *7*	E(n)(lab)=274.6 keV *2*, 2gΓ_n<0.195 keV, Γ_γ=1.48 eV *9*.
8241.3 *3*	(0$^-$)	<0.15 keV	[1]	0.45 *5*	E(n)(lab)=315.6 keV *3*, 2gΓ_n<0.075 keV, Γ_γ=1.80 eV *2*.
8279.1 *3*	(1$^-$)	<0.18 keV	[1]	1.29 *9*	E(n)(lab)=354.6 keV *3*, 2gΓ_n<0.090 keV.
8284.8 *3*	(0$^+$)	1.2 keV *3*	[0]	0.74 *12*	E(n)(lab)=360.5 keV *3*, 2gΓ_n=0.60 keV *15*, Γ_γ=3.0 eV *5*.
8291.1 *3*	(1$^+$)	25 keV	[0]		E(n)(lab)=367.0 keV *3*, 2gΓ_n=5 keV.
8292.0 *3*	(1$^-$)	0.46 keV *8*	[1]	0.95 *1*	E(n)(lab)=368.0 keV *3*, 2gΓ_n=0.69 keV *12*, Γ_γ=1.27 eV *13*.
8300.0 *3*	(2$^-$)	0.64 keV *10*	[1]	1.34 *13*	E(n)(lab)=376.2 keV *3*, 2gΓ_n=1.60 keV *25*. Γ_γ=1.07 eV *20*.
8329.8 *3*	(2$^-$)	<0.2 keV	[1]	2.19 *12*	E(n)(lab)=407.0 keV *3*, 2gΓ_n<0.50 keV. Γ_γ=1.75 eV *10*.
8336.8 *3*	(1$^-$)	1.2 keV *2*	[1]	1.00 *12*	E(n)(lab)=414.2 keV *3*, 2gΓ_n=1.8 keV *3*, Γ_γ=1.33 eV *15*.
8353.8 *4*	(2$^-$)	0.58 keV *7*	[1]	2.19 *18*	E(n)(lab)=431.8 keV *4*, 2gΓ_n=1.45 keV *18*, Γ_γ=1.75 eV *14*.
8356.8 *4*	(1$^-$)	<0.2 keV	[1]	1.18 *13*	E(n)(lab)=434.9 keV *4*, 2gΓ_n=0.30 keV, Γ_γ=1.57 eV *17*.
8357.9	(1$^+$)	<20 keV	[0]		E(n)(lab)=436 keV, 2gΓ_n<30 keV.
8383.1 *5*	(1$^-$)	1.3 keV *3*	[1]	1.28 *16*	E(n)(lab)=462.0 keV *5*, 2gΓ_n=2.0 keV *5*, Γ_γ=1.70 eV *21*.

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^{31}P(n,n),(n,γ),(n,X):res 2018MuZY (continued)

^{32}P Levels (continued)

E(level)[†]	Jπ	Γ	L	gΓ$_n$Γ$_\gamma$/Γ (EV)	Comments
8406.0 *5*	(1$^-$)	1.3 keV *3*	[1]	1.4 *3*	E(n)(lab)=485.7 keV *5*, 2gΓ$_n$=2.0 keV *5*, Γ$_\gamma$=1.80 eV *23*.
8414.2 *5*	(2$^-$)	<0.3 keV	[1]	1.70 *16*	E(n)(lab)=494.1 keV *5*, 2gΓ$_n$=<0.45 keV, Γ$_\gamma$=1.36 eV *24*.
8815[‡]		8.3[‡] keV *7*			
9226[‡]		9.8[‡] keV *6*			
10.20×10^3[‡]		13.1[‡] keV *6*			
11.04×10^3[‡]		13.6[‡] keV *12*			
12.05×10^3[‡]		21.8[‡] keV *16*			
13.70×10^3[‡]		21.8[‡] keV *23*			
16.64×10^3[‡]		74[‡] keV *14*			

[†] From S(n)+E(n), where S(n)=7935.65 *4* (2021Wa16), and E(n)=neutron energy in the c.m. system, converted from E(n)(lab) given under comments.

[‡] From 2000Ab40.