^{88}Sr(d,p),(pol d,p) 1968Co03,1978Cl04,1989Wi05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 114, 1 (2013)	20-Oct-2012

Includes ^{88}Sr(d,polarized p).

1968Co03, 1973Sl01: (d,p) E=7.0 MeV (1968Co03), E=10 MeV (1973Sl01), multiple-gap spectrograph, measured $\sigma(\theta)$, DWBA analysis.

1989Wi05: (d,p) E=7.0 MeV, Q3D spectrometer, measured level energies at 20° and 30°, FWHM=2.5-4 keV.

1978Cl04: (pol d,p) E=12 MeV, FWHM≈30 keV, polarized beams, solid-state detectors, measured vector-analyzing power and $\sigma(\theta)$, DWBA analysis for 14 levels up to 4000 keV.

1977Bl08: (d,p) E=17.5 MeV, FWHM≈18 keV, position-sensitive proportional counters, measured $\sigma(\theta)$, DWBA analysis.

Other (d,p) references:

1984Sa05: (d,p) E=3.4, 3.8, and 4.0 MeV, surface-barrier Si detectors, measured $\sigma(\theta)$, DWBA analysis and deduced $<r^2>$ for 0, 1032, 1940, 2008 and 2452 levels.

1979St23 (also 1973Gr12): (pol d,p) E=5.6-9.0 MeV. Measured $\sigma(\theta)$ and Ay(θ) for g.s..

1971De13: (pol d,p) E=12 MeV. VAP data for 0, 1030, 1930+2000 levels.

1970Za08: E=5.0-10.5 MeV.

1970Ki15, 1967Bu23: E=11 MeV, analysis of $\sigma(\theta)$ data for g.s..

1970Be24: E=20.65 MeV.

1969Bo27: E=12 MeV.

1965Lu03: (d,polarized p) E=11.2 MeV. $\sigma(\theta)$ and proton polarization data for first excited state.

1965Sa06: E=15 MeV.

1964Pr01 (also 1963Pr10): E=11 MeV. Data for 13 levels.

1963Za03 (also 1960Za03):

1962Co06: E=15 MeV.

1954Wa33: E=15 MeV; 0, 1090 level.

1953Mc68 (also 1952Sh36): E=10 MeV; 0, 1070, 2070, 2540 levels.

Holt and Marsham, Proc. Roy. Soc. 66A, 565 (1953): E=8 MeV; 0, 1070, 2090, 2666, 4730, 5460 levels.

1951Ha06: E=14 MeV.

^{89}Sr Levels

$d\sigma/d\Omega$(maximum) in mb/sr (1968Co03) for ED=7.0 MeV
(see 1968Co03 for corresponding θ(maximum))

Energy	$d\sigma/d\Omega$	Energy	$d\sigma/d\Omega$
0	3.50	4679	0.155
1031	(5.0)	4742	0.098
1460	0.031	4759	0.035
1931	0.58	4790	0.040
2000	1.95	4818	0.123
2057	0.075	4865	0.035
2071	0.190	4894	0.030
2266	0.040	4928	0.088
2455	1.680	5005	0.042
2558	0.115	5036	0.082
2671	0.620	5067	0.049
2691	0.046	5081	0.076
2805	0.168	5107	0.035
2918	0.074	5130	0.070
3128	0.450	5148	0.030
3245	0.378	5169	0.205
3390	0.085	5208	0.025
3421	0.365	5242	0.125
3438	0.020	5259	0.115
3546	0.070	5280	0.147 b
3638	0.046	5298	0.147 b
3684	0.060	5333	0.116
3691	0.330	5360	0.895
3757	1.220	5399	0.040
3911	0.045	5418	0.525

4035	0.050	5442	0.020
4046	0.290	5456	0.035
4069	0.129	5480	0.050
4084	0.025	5496	0.070
4168	0.045	5529	0.020
4189	0.105	5540	0.040
4214	0.040	5573	0.050
4315	0.149	5583	0.050
4359	0.076	5611	0.040
4388	0.030	5628	0.070
4434	0.155	5657	0.060
4473	0.220	5666	0.150
4518	0.088	5694	0.035
4560	0.042	5753	0.030
4594	0.294	5773	0.100
4614	0.195 a	5825	0.035
4626	0.195 a	5858	0.040
4651	0.061		

a: for 4614+4626
b: for 5280+5298

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dσ/dΩ(maximum) in mb/sr (1978Cl04) ED=12 MeV
(angle at which cross section is maximum is unspecified)

Energy	dσ/dΩ	Energy	dσ/dΩ
0	9.61	2805	0.36
1031	8.21	3128	0.90
1931	1.85	3245	0.84
2000	5.35	3390	0.23
2071	0.50	3421	0.13
2443	3.57	3686	0.67
2675	1.52	3755	0.94

E(level)[†]	J^{π}[‡]	L[#]	$(2J_f+1)S$[@]	Comments
0	5/2+	2	6.18	$(2J_f+1)S$: 4.76 (1968Co03), 3.9 from C^2S=0.65 (1977Bl08), 5.16 (1984Sa05). $<r^2>^{1/2}$=5.15 fm *+12−9* (1984Sa05).
1031[&] *5*	1/2+	0	2.12	$(2J_f+1)S$: others: 1.81 (1968Co03), 1.76 from C^2S=0.88 (1977Bl08), 1.78 (1984Sa05). $<r^2>^{1/2}$=5.43 fm *+12−8* (1984Sa05).
1460[&] *5*				Spectroscopic amplitude=−0.2 from coupled-channel analysis of non-stripped state described as 2^+ coupled to $d_{5/2}$ neutron (1977Bl08).
1940 *5*	5/2+	2	0.66	$(2J_f+1)S$: others: 0.548 (1968Co03), 0.60 from C^2S=0.10 (1977Bl08), 0.54 (1984Sa05). E(level): 1931 (1968Co03). $<r^2>^{1/2}$=5.38 fm *+14−9* (1984Sa05).
2008 *5*	3/2+	2	2.44	E(level): 2000 (1968Co03). $(2J_f+1)S$: other: 1.85 (1968Co03), 2.12 from C^2S=0.53 (1977Bl08), 2.16 (1984Sa05). $<r^2>^{1/2}$=5.23 fm *+13−8* (1984Sa05).
2061 *5*				Additional information 1. Spectroscopic amplitude≤0.05 is from coupled-channel analysis of non-stripped state described as 2^+ coupled to $d_{5/2}$ neutron (1977Bl08).
2079 *5*	11/2−	5	4.68	E(level): 2071 (1968Co03). $(2J_f+1)S$: other: 3.36 from C^2S=0.28 (1977Bl08).
2281 *5*	(1/2)−	1	0.011	E(level): 2266 (1968Co03). Spectroscopic amplitude=−0.02 from coupled-channel analysis of non-stripped state described as 3^- coupled to $d_{5/2}$ neutron (1977Bl08).
2456 *5*	3/2+	2	1.68	E(level): 2443 *3* (1978Cl04), 2455 (1968Co03).

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^{88}Sr(d,p),(pol d,p) 1968Co03,1978Cl04,1989Wi05 (continued)

^{89}Sr Levels (continued)

E(level)[†]	J^{π}[‡]	L[#]	$(2J_f+1)S$[@]	Comments
				$(2J_f+1)S$: others: 1.36 (1968Co03), 1.40 from C^2S=0.35 (1977Bl08), 1.52 (1984Sa05). $<r^2>^{1/2}$=5.29 fm *+13−8* (1984Sa05).
2575 *5*	$(3/2)^-$	1	0.015	E(level): 2558 (1968Co03). Spectroscopic amplitude=+0.05 is from coupled-channel analysis of non-stripped state described as 3^- coupled to $d_{5/2}$ neutron (1977Bl08).
2675 *4*	$7/2^+$	4	7.84	$(2J_f+1)S$: others: 5.89 (1968Co03), 5.03 (1973Sl01), 7.20 from C^2S=0.90 (1977Bl08). E(level): 2671 (1968Co03), 2689 (1977Bl08).
2696 *4*	$(5/2^-)$			E(level): 2710 (1977Bl08), 2691 (1968Co03). Spectroscopic amplitude=+0.07 from coupled-channel analysis of non-stripped state described as 3^- coupled to $d_{5/2}$ neutron (1977Bl08).
2805 *3*	$(7/2^-,5/2^+)$	3,(2)	0.24,0.24	L,$(2J_f+1)S$: others: 0.141 for L=(2) (1968Co03). From coupled-channel calculations, spectroscopic amplitude=−0.15 (1977Bl08) for $7/2^-$. E(level): 2805 (1968Co03,1978Cl04), 2819 (1977Bl08).
2916 *5*		2	0.038	E(level): 2918 (1968Co03), 2926 (1977Bl08). $(2J_f+1)S$: 0.04 from C^2S=0.01 (1977Bl08).
2959? *20*				Reported by 1977Bl08 only and, tentatively, described a non-stripped $(9/2^-)$ state arising from 3^- coupled to $d_{5/2}$ neutron.
3073 *9*		2	0.04	E(level): 3082 (1977Bl08), 3070 (1973Sl01). L,$(2J_f+1)S$: from C^2S=0.01 for L=2 (1977Bl08). Other: 0.036, 0.015 for L=(2,1) in 1973Sl01.
3128 *5*	$3/2^+$	2	0.36	$(2J_f+1)S$: 0.317 (1968Co03), 0.308 (1973Sl01), 0.24 from C^2S=0.06 (1977Bl08). E(level): 3137 (1977Bl08), 3128 (1978Cl04,1968Co03).
3200[a] *7*				
3249 *9*	$5/2^+$	2,(3)	0.36,0.54	E(level): 3245 (1968Co03,1978Cl04), 3260 (1977Bl08). $(2J_f+1)S$: 0.260 for L=2 (1968Co03), 0.266 for L=2 (1973Sl01).
3390[&] *10*	$11/2^-$	5	0.72	L: from 1978Cl04. $(2J_f+1)S$: 0.65 for L=4 (1968Co03), 0.15, 0.85 for L=(3,4) (1973Sl01).
3421[&] *10*	$(11/2^-)$	5	0.36	L: from 1978Cl04. $(2J_f+1)S$: 0.084 for L=2 (1973Sl01), L=(0) from 1968Co03.
3438[&] *10*				E(level): group reported by 1989Wi05 corresponds to 3433.1 in (n,γ).
3468[a] *1*				
3497 *4*		2	0.014	Additional information 2. L,$(2J_f+1)S$: from 1973Sl01.
3541 *8*				Additional information 3.
3598[a] *8*				
3634 *6*		3	0.020	Additional information 4. L,$(2J_f+1)S$: from 1973Sl01.
3677 *7*				E(level): 3684 (1968Co03).
3687 *6*	$5/2^+$	2	0.30	Additional information 5. $(2J_f+1)S$: 0.199 (1968Co03,1973Sl01).
3745[a] *7*				
3755 *7*	$1/2^+$	0	0.24	Additional information 6. $(2J_f+1)S$: 0.215 (1968Co03), 0.172 (1973Sl01).
3763[a] *7*				
3829 *6*		2	0.010	Additional information 7.
3881[a] *7*				
3910 *7*				Additional information 8.
3937[a] *7*				
3982[a] *6*				
4017[a] *5*				
4034 *5*				Additional information 9.
4047 *5*		0	0.039	Additional information 10.
4055[a] *4*				
4065 *6*		(0,3)	0.016,0.15	Additional information 11.

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^{88}Sr(d,p),(pol d,p) 1968Co03,1978Cl04,1989Wi05 (continued)

^{89}Sr Levels (continued)

E(level)[†]	L[#]	$(2J_f+1)S$[@]	Comments
4081 *4*			Additional information 12.
4120[a] *5*			
4168 *7*	(2)	0.015	Additional information 13.
4180[a] *7*			
4199 *7*			E(level): 4189 (1968Co03).
4207[a] *7*			
4222 *7*			E(level): 4214 (1968Co03).
4227[a] *7*			
4233[a] *7*			
4247[a] *7*			
4254[a] *7*			
4271[a] *7*			
4315[&] *10*	2	0.049	$(2J_f+1)S$: 0.024, 0.230 for L=(0,3) (1968Co03).
4359[&] *10*			
4382 *7*			Additional information 14.
4406[a] *7*			
4417[a] *7*			
4435 *7*	(3)	0.120	Additional information 15. $(2J_f+1)S$: 0.064 for L=(2) (1968Co03).
4465[a] *8*			
4472 *8*	0	0.033	Additional information 16. $(2J_f+1)S$: 0.037 (1968Co03).
4518 *10*	4	0.448	
4560 *10*	(2)	0.006	
4594 *10*	2	0.143	$(2J_f+1)S$: 0.053 for L=0 (1968Co03).
4614 *10*	0	0.050	$(2J_f+1)S$: 0.034 for 4614+4626 (1968Co03).
4626 *10*			E(level): unresolved from 4614.
4651 *10*	0[c]	0.011[c]	
4679 *10*	(2,1)	0.057,0.026	$(2J_f+1)S$: 0.071 for L=2 (1968Co03).
4742 *10*	(0)[c]	0.015[c]	
4759 *10*			
4790 *10*			
4818 *10*	(4,3)	0.45,0.18	$(2J_f+1)S$: 0.046 for L=(2) (1968Co03).
4865 *10*	(4)	0.100	
4894 *10*			
4928 *10*	(1,2)	0.013,0.027	
5005 *10*			
5036 *10*	0	0.013	$(2J_f+1)S$: 0.037 for L=(2) (1968Co03).
5067 *10*	2	0.017	
5081 *10*	2	0.021	$(2J_f+1)S$: 0.035 (1968Co03).
5107 *10*			
5130 *10*			
5148 *10*			
5169 *10*	(2)	0.056	$(2J_f+1)S$: 0.054 for L=(0) (1968Co03).
5208 *10*			
5242 *10*			
5259 *10*			
5280 *10*	0[b]	0.024[b]	
5298 *10*	0[b]	0.024[b]	
5333 *10*			
5360 *10*	0[c]	0.163[c]	
5399 *10*			
5418 *10*	(0)[c]	0.100[c]	
5442 *10*			

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^{88}Sr(d,p),(pol d,p) 1968Co03,1978Cl04,1989Wi05 (continued)

^{89}Sr Levels (continued)

E(level)†	E(level)†	E(level)†	E(level)†
5456 *10*	5540 *10*	5628 *10*	5753 *10*
5480 *10*	5573 *10*	5657 *10*	5773 *10*
5496 *10*	5583 *10*	5666 *10*	5825 *10*
5529 *10*	5611 *10*	5694 *10*	5858 *10*

† From 1977Bl08 for levels below 2600 and from 1989Wi05 for levels between 2600 and 4500, unless otherwise stated. Levels above 4500 are given by 1968Co03 only. 1968Co03 list 85 levels up to 5858 whereas 1989Wi05 list 55 levels up to 4472.

‡ From DWBA analysis of $\sigma(\theta)$ and analyzing power (1978Cl04). The values assigned in Adopted Levels are based mostly on these data.

From DWBA analysis of $\sigma(\theta)$ (1973Sl01), unless indicated otherwise.

@ From DWBA analysis of $\sigma(\theta)$ (1978Cl04) for levels up to 3760, unless indicated otherwise. 1984Sa05 present a set of renormalized values based on data from 1978Cl04 which are used to deduce the reported rms radii for neutron orbits. Above 3760, values are from 1973Sl01, unless otherwise stated.

& From 1968Co03.

a Reported by 1989Wi05 only.

b Composite for 5280+5298.

c From 1968Co03.