^{208}Pb(γ,n),(γ,pol n)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 108,1583 (2007)	1-Jun-2007

1969Bo14 E(n)=0-40 keV.
1970Bo24 E(n)=30-860 keV.
1970Ve03 E(γ)=6-35 MeV, FWHM(γ)=140 keV At 10 MeV, increasing to 400 keV At 25 MeV.
1971Ba07 E(n)=3-870 keV.
1972To14 E(n)=180-1000 keV.
1975Ha26 E(n)=30-850 keV.
1975Jo04 E(n)=1670-4250 keV, FWHM=6.8 At 1000 to 78 keV At 5000.
1975Sh19 E(n)=1160-3790 keV.
1976Ho02 E(pol N)=500-1000 keV.
1977Ho03 E(pol N)=180-320 keV, FWHM=2 keV At 180 to 4 keV At 320.
1977La02 E(n)=840-2500 keV, FWHM=3 keV At 840 to 14 keV At 2500 E(pol N)=850-2700 keV, FWHM=20 keV At 850 to 100 keV At 2700.
1978Va01 E(γ)=8-13 MeV.
1979Ho12 E(n)=16-1000 keV, FWHM=0.2 At 180 to 1.5 keV At 1000.
1981Bi13 E(γ)=7.0-11.4 MeV from Fe, Ni, and Cr(n,γ) source.
1982Be04 E(γ)=9.9-11.2 MeV, FWHM(γ)=120 keV.
1983Ba04 E(γ)=7-11 MeV from Ni and Cr(n,γ) source.
1984Be55 E(γ)=7-12.15 MeV. Superseded by 1985Be55.
1984Sm07 E(γ)=9.2 MeV from ^{13}C(p,γ), Doppler shift.
1985Be55 E(γ)=7-12 MeV bremsstrahlung. Measured σ In 25-keV steps.
Others: 1971Ba38, 1970Is07, 1977ShZS.
S(n)=7367.87 *5*.
In addition to the giant dipole excitation, 1970Ve03 report peaks In the total cross section At excitation energies of 7.6, 8.0, 8.3, 9.9, 11.2, 11.8? MeV corresponding to resonance energies of 200, 600, 900, 2500, 3800, and 4400? keV. The resonance At 9.9 MeV has a Γ of≈500 keV. 1978Va01 report peaks At excitation energies 9.2, 9.8, 10.3, 10.7, 11.2, 11.6, and 12.3 MeV (ΔE=0.1) corresponding to resonance energies 1800, 2400, 2900, 3300, 3800, 4200, and 4900 keV. 1984Be55 report peaks At excitation energies (Γ) of 7.6 (0.1), 8.0 (0.1), 8.5 (0.16), 9.0 (0.13), 9.3 (0.13), 10.0 (0.15), 10.6 (0.15) and 11.3 (0.22) corresponding to resonance energies of 200, 600, 1100, 1600, 1900, 2600, 3200, and 3900 keV. On the basis of $\sigma(\theta)$, 1981Bi13, 1982Be04, and 1983Ba04 show the presence of multipole mixing, probably E2-E1, In the excitation region 7-11 MeV (M1-E1 interference cannot Be ruled out). 1983Ba04 estimate an average B(E2)↑ of 0.17 *5* per MeV In the energy region 7.8 to 10 MeV (%EWSR=16 *5*).

^{208}Pb Levels

E(level)[†]	$\Gamma_{\gamma 0}$ (eV)[‡]	Comments
S(n)+3.0[#]	0.06[c] *3*	
S(n)+10.1[#]	0.044[c] *15*	
S(n)+16.2[#]	0.10[c] *3*	
S(n)+16.8	0.01	
S(n)+25.3?		E(level): reported by 1970Bo24. Not seen by 1971Ba07.
S(n)+30.4	0.3[a]	
S(n)+37.6	0.64	
S(n)+41.1	3.5	
S(n)+48.2	0.02[d]	
S(n)+90.5	1.3	
S(n)+102.3	0.23[a]	
S(n)+115.2	1.1	
S(n)+127.0	1.4	
S(n)+130.9	0.76	
S(n)+156.3	0.46	

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^{208}Pb(γ,n),(γ,pol n) (continued)

^{208}Pb Levels (continued)

E(level)[†]	J$^\pi$[&]	$\Gamma_{\gamma 0}$ (eV)[‡]	Comments
S(n)+181	1$^-$[@]	7.3	J$^\pi$: J$^\pi$=1$^+$ assigned by 1975Ha26, 1972To14, 1971Ba07 on the basis of $\sigma(\theta)$ data. J$^\pi$=1$^-$ confirmed In ^{207}Pb(N).
S(n)+248		1.64[a]	
S(n)+256.1	1$^-$[@]	13.1	
S(n)+283.7		0.43[a]	
S(n)+298		0.40	
S(n)+316.7	1$^-$[@]	6.4	J$^\pi$: J$^\pi$=1$^+$ assigned by 1975Ha26, 1971Ba07 on the basis of $\sigma(\theta)$ data. J$^\pi$=1$^-$ confirmed In ^{207}Pb(N).
S(n)+335		0.50	
S(n)+423		0.53	
S(n)+429		1.3[a]	
S(n)+453		4.0[a]	
S(n)+486		1.81[a]	
S(n)+493		1.91[a]	
S(n)+504		0.81[a]	
S(n)+542	1$^-$	6.1	
S(n)+548		0.38[d]	
S(n)+553		3.69[a]	
S(n)+600		0.37[a]	
S(n)+606	1$^-$	5.5	
S(n)+616	1$^-$	8.9	J$^\pi$: from 1979Ho12 based on the interference pattern In $\sigma(\theta)$ between the 606 and 616 resonances. Earlier (γ,pol n) measurements (1976Ho02) had led to a J$^\pi$=1$^+$ assignment. J$^\pi$=1$^-$ is confirmed In ^{207}Pb(N).
S(n)+636		0.40[a]	
S(n)+644		0.13[d]	
S(n)+653	1$^-$	6.9	J$^\pi$: J$^\pi$=1$^+$ assigned by 1975Ha26, 1971Ba07 on the basis of $\sigma(\theta)$ data. J$^\pi$=1$^-$ is confirmed In ^{207}Pb(N).
S(n)+701		3.1	
S(n)+728		0.85[a]	
S(n)+738	1$^-$	2.0	
S(n)+780		0.25[d]	
S(n)+821		0.69[a]	
S(n)+838		0.55[a]	
S(n)+842		1.69[a]	
S(n)+848	1$^-$	4.1	
S(n)+857		1.7	
S(n)+888		0.37[a]	
S(n)+900		0.41[a]	
S(n)+911	1$^-$	1.9	
S(n)+930		0.41[a]	
S(n)+947		1.35[a]	
S(n)+956	1$^-$	3.0	
S(n)+975		0.40[a]	
S(n)+980		1.43[a]	
S(n)+995		2.86[a]	
S(n)+1002	1$^-$	3.4	authors value of 3.7 is a misprint (priv comm from author).
S(n)+1044 *10*			
S(n)+1074 *10*			
S(n)+1117 *10*			
S(n)+1143 *10*			
S(n)+1154 *10*			
S(n)+1172 *10*			

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^{208}Pb(γ,n),(γ,pol n) (continued)

^{208}Pb Levels (continued)

E(level)[†]	$\Gamma_{\gamma 0}$ (eV)[‡]	Comments
S(n)+1192 *10*		
S(n)+1202 *10*		
S(n)+1212 *10*		
S(n)+1225 *10*	2.3[b] *7*	
S(n)+1237 *10*	2.1[b] *7*	
S(n)+1286 *10*		
S(n)+1293 *10*		
S(n)+1303 *10*		
S(n)+1328 *10*	1.9[b] *2*	
S(n)+1338 *10*	5.8[b] *2*	
S(n)+1365 *10*		
S(n)+1381 *10*		
S(n)+1409 *10*		
S(n)+1436 *10*		
S(n)+1452 *10*		
S(n)+1470 *10*		
S(n)+1503 *10*		
S(n)+1519 *10*		
S(n)+1549 *10*		
S(n)+1598 *10*		
≈S(n)+1604		
S(n)+1649 *10*	2.8[b] *2*	
S(n)+1674 *10*	13.9[b] *3*	
S(n)+1732 *10*		
S(n)+1741 *10*		
S(n)+1780.4[e] *3*	2.6[e] *3*	$\Gamma_{\gamma 0}$: 1977La02 report 2.9 *7*.
S(n)+1793.3[e] *3*	1.8[e] *4*	$\Gamma_{\gamma 0}$: 1977La02 report 2.6 *6*.
S(n)+1807.3[e] *3*	4.2[e] *9*	
S(n)+1810.9[e] *4*	3.2[e] *19*	
S(n)+1826.0[e] *3*	9.3[e] *10*	
S(n)+1838?[e]	10.7[e] *7*	
S(n)+1845.9[e] *3*	1.3[e] *4*	
S(n)+1890 *10*		
S(n)+1940 *10*	1.6[b] *3*	
S(n)+1955 *10*	4.0[b] *8*	
S(n)+1977 *10*		
S(n)+1994 *10*		
S(n)+2032 *10*		
S(n)+2052 *10*		
S(n)+2066 *10*		
S(n)+2098 *10*		
S(n)+2157 *10*	2.0[b] *4*	
S(n)+2176 *10*	3.0[b] *7*	
S(n)+2207 *10*		
S(n)+2224 *10*		
S(n)+2280 *10*	0.94[b] *19*	
S(n)+2300 *10*	4.8[b] *10*	
S(n)+2320 *10*	0.69[b] *13*	
S(n)+2461 *10*		
S(n)+2505 *10*		
S(n)+2551 *10*	4.1[b] *8*	
S(n)+2594 *10*		

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^{208}Pb(γ,n),(γ,pol n) (continued)

^{208}Pb Levels (continued)

E(level)[†]	Comments
13420	E(level): from 1970Ve03. Γ=4.05 MeV. %EWSR≈103. configuration:isovector giant dipole resonance.

[†] For convenience In comparing the resonance energies with values reported In ^{207}Pb(n,γ) and ^{207}Pb(n,X), the values given are lab coordinate neutron energies corresponding to the inverse ^{207}Pb(n,γ) reaction. Thus, E(n,γ)=1.0097 E(γ,n) to a sufficient accuracy considering the uncertainties quoted In the E(n). Except where noted, data are from 1979Ho12 for E(n)≤1002 and from 1977La02 for E(n)≥1044. Uncertainties are 0.5 to 1.0 keV, unless given otherwise. Values of 1977La02 have been read by the evaluator from the authors′ figures 2 and 3. They have been normalized to E(n)=910.4 *9* from ^{207}Pb(n,γ) and 1674 *10* from 1975Sh19.

[‡] Values given are ground-state decay widths (for J=1, except where noted otherwise) In eV, from 1979Ho12. Values are obtained relative to the ^{2}H(γ,n) cross section. Overall uncertainties are 15% for resonances with $\Gamma_{\gamma 0}$>1 eV. Note that, on the basis of this normalization, $\Gamma_{\gamma 0}$=3.5 *5* for the 41.4 resonance compared with 5.07 *18* obtained In ^{207}Pb(n,γ). The (n,γ) values are normalized to the value for the 41.4 resonance, a normalization 44% larger than In (γ,n); however, As shown by 1979Ho12, the average excess, for 32 resonances, is 66%. Others: 1975Ha26, 1972To14.

[#] From 1971Ba07.

[@] From 1977Ho03 based on measurement of neutron polarization At θ=90° and 135° with the assumption that the resonance is isolated.

[&] From 1976Ho02, except where noted otherwise, based on measurement of neutron polarization At θ=90° and 135° with the assumption that the resonance is isolated. 1977La02 suggest that the resonances centered At 850, 990, 1220, 1320, 1650, 1770, and 1920 contain At least one J=1$^-$ and one J=1$^+$ member, and that the resonances centered At 2140, 2260, 2290, and 2520 have At least one J=1$^-$ and one J=1$^+$ or 2$^+$ member.

[a] Value given is g$\Gamma_{\gamma 0}$ where g=(2J+1)/2.

[b] From 1977La02. The authors quote $\Gamma_{\gamma 0}$=11.0 for E=651 relative to 4.2 for E=41.0. The evaluator has renormalized to $\Gamma_{\gamma 0}$=6.9 for E=651 to correspond to 3.5 for E=41.0 as obtained by 1979Ho12. The uncertainties do not include the uncertainty due to absolute normalization.

[c] From 1969Bo14 for J=2.

[d] For J=2.

[e] From 1984Sm07. Γ value for J=1.