^{208}Pb(e,e′),(e,e′n)

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

1968Zi02 E=28-73 MeV.
1970He18 E=502 MeV, momentum transfer=0.5-2.8 fm^{-1}.
1971Na24 E=183.0, 248.2 MeV, θ=35°−105°.
1972Bu38 E=50, 65 MeV. See 1977Pi08.
1972Fr07 E=124, 167 MeV.
1973FaZT E=50.5 MeV.
1973Na05 E=124-250 MeV, momentum transfer=0.5-0.8 fm^{-1}.
1974Ro26 analysis of earlier works.
1975Li19 E=37.5-60.5 MeV, θ=177°.
1975Sc33 E=50 MeV, FWHM≈38 keV.
1976Fr18 E=119.6 MeV, momentum transfer=0.5-1.6 fm^{-1}.
1977Pi08 E=50,65 MeV reanalysis of data of 1972Bu38.
1978Fr06,1978FrZL E=50,63.5 MeV, FWHM=24 to 45 keV, θ=170°.
1979Li13,1979LiZQ,1978Li05 E=50-335 MeV, momentum transfer=.
1980Go12 E=52-335 MeV, momentum transfer=1.74-3.4 fm^{-1},
1980Li04 E=70-335 MeV, momentum transfer=0.7-2.5 fm^{-1}.
1981Ku14 E=30,40,50 MeV.
1982He03 E=50-335 MeV, momentum transfer=0.5-2.6 fm^{-1}.
1982Hi10 E=40.5, 50.4, 60.3, 75.2 MeV, θ=180°.
1982Pa05 E=50-335 MeV, momentum transfer=0.37-3.4 fm^{-1} At.
1983Mu03 E=23.3,36.4,49.8,61.2 MeV,
1983HeZT,1983HeZU see 1979Li13 for experimental details.
1984CaZT E=80 MeV, momentum transfer=0.26, 0.31, 0.37 fm^{-1}.
1985Mu01 momentum transfer=0.44-1.59 fm^{-1}.
1987Sc19 E=29-48 MeV. FWHM=22-41 keV N.
1988Bo22 E=57.0, 67.6, 80.4 MeV. Momentum transfer=0.26, 0.31, and.
1992Co14 E=100-300 MeV. Momentum transfer=1.1-2.9 fm^{-1}.
1997Ka17 E=30-50 MeV, FWHM=35-50 keV.
Others: 1961Cr01, 1963Ke05, 1973EnZZ. See 1982Fr01, 1981Fr03, 1980Dz04 for charge distribution parameters.

0.3-2.5 fm^{-1}, FWHM ≈ 30-50 keV. θ=90 °, 160 °

θ=38 °-79 °.
E=502.0 MeV, Momentum Transfer=0.55-2.6 fm^{-1} At
θ=90 °, 160 °

At θ=90 °, 160 °

At θ=90 °, 160 °. FWHM ≈ 30 keV

θ=90 °, 0.70-2.55 fm^{-1} At θ=160 °.
E=502 MeV, Momentum Transfer Extended To 3.4 fm^{-1},
θ=38 °-79 °

Momentum Transfer=0.20-0.59 fm^{-1},
FWHM=26-43 keV (preliminary Data Reported In 1983Ri11)

Superseded By 1988Bo22

0.47 fm^{-1}. The Authors Studied (e,e′n)

FWHM=12-18 keV At Forward Angles, 16-24 keV At Backward
Angles

^{208}Pb Levels

1978Fr06 state that they observe 44 levels In the energy range 6 to 8 MeV. The authors analyze only 10 of these levels. See

1978FrZL for other levels.

There is No evidence for M1 structure, with Γ and strength similar to the 7480 peak, In the excitation range 9-19 MeV (1982Hi10).

B(M2): from 1978Fr06. Value is read by evaluator from authors′ figure. Authors obtain Σ B(M2)=85 *8* for the eight 2^- levels they observe. 1975Li19 report Σ B(M2)=53 *9* for the two broad levels At 7400 and 7910. Other: 1982Hi10.

Configuration assignments are from 1979LiZQ, 1980Li04, 1982He03, and 1992Co14, and are given only for levels with one dominant configuration.

E(level)[†]	Jπ[‡]	$T_{1/2}$	L[i]	Comments
0.0				
2615	3^-	16.6 ps *4*	3	B(E3)↑=0.612 *13* $T_{1/2}$: from B(E3). L: 1968Zi02 report L=3. B(E3)↑: from model-independent analysis by 1980Go12 of σ data of 1968Zi02, 1970He18, 1971Na24, 1972Fr07, and authors′ own data. From a similar analysis of these data (except 1980Go12) 1974Ro26 obtained B(E3)=0.69 *5*.
3198	5^-		5	B(E5)↑=0.0447 *30* (1982He03) L: 1968Zi02 report L=5. B(E5)↑: see also 1982Pa05. Others: 1971Na24 (0.045 *6*), 1968Zi02 (0.06 *2*).
3709	5^-			B(E5)↑=0.0241 *18* (1982He03) B(E5)↑: see also 1982Pa05. Other: 1971Na24 (0.032 *8*).
3961	5^-			B(E5)↑≈0.0008 (1982He03)
4037	7^-			B(E7)↑≈0.0010 (1982He03)
4085	2^+	0.78 fs *4*	2	B(E2)↑=0.318 *16* $T_{1/2}$: from B(E2) and g.s. branching=0.9954 *15*. L: 1968Zi02 report L=2. B(E2)↑: from 1982He03 based on their data and those of 1968Zi02.
4125				
4160[#] *20*	5^-[e]			
4255[#]				E(level): multiplet.
4324	4^+	11.7 ps *+15−18*	4	B(E4)↑=0.155 *11* $T_{1/2}$: from B(E4) and g.s. branching=0.00260 *+27−35*. L: 1968Zi02 report L=4. B(E4)↑: from 1982He03. Others: 1971Na24 (0.13), 1968Zi02 (0.23 *2*).
4370[#]	6^-[e]			
4424	6^+			B(E6)↑=0.067 *7* (1982He03)
4480[#]	6^-[e]			
4610	8^+		8	BE8UP=0.0054 *9* (1982He03)
4700[#]	3^-[e]		3	Jπ: peak also contains other Jπ components.
4760				
4830[d]				L: form factor is complex, but contributions from L=8-10 are evident.
4841[&]	1^-[&]			
4890[b] *10*	10^+[b]			
4970[#]	3^-[e]			
5010[#]	9^+[e]			CONF=$\nu 2g_{9/2}\nu 1i^{-1}_{13/2}$. Jπ: the tentative assignment of 1979LiZQ is confirmed by 1992Co14.
5070[b] *10*	10^+[b]		10	
5214[#]	(5^-)[e]			
5240[#]	3^-[e]	5.3 fs *+16−11*		B(E3)↑=0.13 *3* (1968Zi02) Jπ: 1976Fr18 report L=4 + L>4 for E=5230. 1968Zi02 report L=3,4. $T_{1/2}$: from B(E3) and g.s. branching=0.0089 *+1−3*.
5260[g] *6*	9^+[g]			configuration=$\pi 1h_{9/2}\pi 1h^{-1}_{11/2}$.

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^{208}Pb(e,e′),(e,e′n) (continued)

^{208}Pb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	L[i]	Comments
5270[#]	$(11^+)^e$			
5291[g] *6*	$11^+{}^g$			configuration=$\nu 2g_{9/2}\nu 1i^{-1}_{13/2}$.
5345[#]	$3^-{}^e$		3	
5380				
5486				
5507[f]				
5514[#]	$(3^-)^e$			
5540[#] *15*	$10^+{}^e$			Jπ: complex peak. 10^+ component not fully resolved. Other components In addition to 7^-,10^+ are present. See also 5541 level.
5541[#]	$7^-{}^e$			Jπ: complex peak. 7^- component not fully resolved. Other components In addition to 7^-,10^+ are present. See also 5540 level.
5565[#]	$(4^+)^e$			
5615				
5652				
5690[#]	$4^+{}^e$		4	
5720[#]	$(2^+)^e$			
5780				
5812				
5846[f] *5*	1^+			B(M1)↑=1.01 *+42−13* (1985Mu01) B(M1)↑: for isoscalar excitation. Isovector nature is ruled out (1985Mu01). The uncertainty In B(M1) does not include any systematic component.
5860[g] *6*	$11^+{}^g$			configuration=$\nu 1i_{11/2}\nu 1i^{-1}_{13/2}$.
5920[b] *15*	$10^+{}^b$			
5954[g] *6*	$9^+{}^g$			configuration=$\nu 1i_{11/2}\nu 1i^{-1}_{13/2}$ + $\pi 2f_{7/2}\pi 1h^{-1}_{11/2}$.
5990[#]	$6^+{}^e$		6	
6010				
6050				
6110[b] *6*	$12^+{}^b$			configuration=$N1i_{11/2}\nu 1i^{-1}_{13/2}$. E(level): from 1992Co14. 1980Li04 report 6100 *10*.
6193[h] *3*	$2^+{}^@$	0.62 fs *5*		B(E2)↑=0.0505 *37* Jπ: longitudinal form factor well fitted by curve reproducing the momentum-transfer dependence of excitation of the 2^+ level At 4086 (1982Hi10). $T_{1/2}$: from B(E2) if g.s.-branching=100%. B(E2)↑: from 1982Hi10 based on analysis of unpublished data of 1978FrZL and 1979LiZQ and data of 1982He03. 1968Zi02 report B(E2)=0.07 *2*. 1973FaZT report $\Gamma_{\gamma 0}\approx 11$ eV.
6239[h] *8*				
6250				
6264[h] *4*				
6283[g] *6*	$10^-{}^g$			configuration=$\pi 1j_{15/2}\pi 1i^{-1}_{13/2}$.
6343[h] *10*	$3^-{}^@$			
6367[h] *10*	2^+,$(3^-)^@$			
6403[h] *10*	$3^-{}^@$			
6428[c] *10*	$2^-{}^c$			B(M2)↑≈2.4
6437[a] *6*	$12^-{}^a$			configuration=$\nu 1j_{15/2}\nu 1i^{-1}_{13/2}$. E(level): from 1992Co14. 1979Li13 report E=6430 *15*.
6485[c] *4*	$2^-{}^c$			B(M2)↑≈8
6520[h] *10*				
6588[c] *10*	$2^-{}^c$			B(M2)↑≈3
6620[h] *2*	$3^-{}^@$			

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^{208}Pb(e,e′),(e,e′n) (continued)

^{208}Pb Levels (continued)

E(level)[†]	Jπ[‡]	Comments
6667[h] *10*		
6701[h] *9*	1^-,(2^-,3^-)[@]	
6735[h] *10*		
6745[a] *6*	14^-[a]	configuration=$\nu 1j_{15/2}\nu 1i^{-1}_{13/2}$. E(level): from 1992Co14. 1979Li13 report E=6740 *10*.
6766[h] *10*		
6786[h] *6*	3^+,(2^-)[@]	
6833[g] *6*	(8^-)[g]	configuration=$\nu 1j_{15/2}\nu 1i^{-1}_{13/2}$.
6859[g] *6*	9^-[g]	configuration=$\pi 1i_{13/2}\pi 1h^{-1}_{11/2}$.
6865[#]	10^-[e]	
6879[g] *6*	7^-[g]	configuration=$\pi 1i_{13/2}\pi 1h^{-1}_{11/2}$.
6884[g] *6*	10^-[g]	configuration=$\pi 1i_{13/2}\pi 1h^{-1}_{11/2}$.
6929[c] *3*	2^-[c]	B(M2)↑≈20
6972[h] *10*		
6990		
7000[#]	(9^+)[e]	
7020[h] *10*	1^-,(2^+,3^-)[@]	
7064[a] *6*	12^-[a]	configuration=$\pi 1i_{13/2}\pi 1h^{-1}_{11/2}$. E(level): from 1992Co14. 1979Li13 report 7060 *10*.
7068[h] *2*	1^-,(3^-)[@]	
7086[g] *6*	12^-[g]	configuration=$\pi 1i_{13/2}\pi 1h^{-1}_{11/2}$.
7108[h] *10*	1^-,(3^-)[@]	
7143[h] *10*	3^+,(2^-)[@]	
7201[h] *6*		
7255[h] *10*		
7272[h] *10*		
7313[h] *4*	3^+,(2^-)[@]	
7344[h] *4*	2^+[@]	
7385[h] *10*	3^-,(1^-)[@]	
7415[h] *10*	1^-,(3^-)[@]	
7457[c] *3*	2^-[c]	B(M2)↑≈11
7482[h] *10*	3^-,(1^-)[@]	E(level): 1982Hi10 tentatively identify a peak At 7480 with the concentration of M1 strength observed In (n,γ) (E=resonance) between≈7400 and≈7550 levels. B(M1)=14-26, much larger than the average value of 5.2 from (n,γ) and (γ,n). The authors emphasize that the (e,e′) value is very sensitive to nuclear structure effects since it is, of necessity, extracted from the form factor In a region beyond the first diffraction maximum.
7509[c] *4*	2^-[c]	B(M2)↑≈10
7552[h] *5*	1^-,(2^-,3^+)[@]	
7622[h] *10*	1^-,(2^-,3^-)[@]	
7656[h] *10*		
7700[h] *10*		
7740[h] *10*		
7766[h] *4*	2^+,(1^-,3^-)[@]	
7808[h] *6*	3^-,(1^-,2^+)[@]	
7845[h] *10*		
7872[h] *6*	2^+,(1^-,2^-)[@]	
7924[c] *3*	2^-[c]	B(M2)↑≈20

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^{208}Pb(e,e′),(e,e′n) (continued)

^{208}Pb Levels (continued)

E(level)[†]	Jπ[‡]	Comments
7961[h] *3*	3⁻,(1⁻)[@]	
8008[c] *3*	2⁻[c]	B(M2)↑≈11
8400		E(level): from 1977Pi08.
8.9×10³ *2*		E(level): from 1977Pi08. Others: 8900 (1997Ka17, 1975Sc33, 1973Na05). Γ=2.0 MeV *2* (1977Pi08). Other: 1.3 MeV *2* (1975Sc33). %EWSR=35 (for E2) (1975Sc33) 1973Na05, 1974Pi07, 1977Pi08, 1997Ka17.
9400		E(level): from 1997Ka17, 1977Pi08, 1973Na05.
9600		E(level): from 1997Ka17.
10.4×10³ *4*		E(level): from 1988Bo22. Others: 1972Bu38, 1973Na05, 1974Pi07, 1977Pi08. This peak is split by 1977Pi08 into three components with E=10.07 MeV *3*, 10.60 MeV *4*, and 11.37 MeV *5* with widths(keV)= 0.20 MeV *5*, 0.36 MeV *6*, and 0.37 MeV *5*, respectively. See also 1973Na05. 1997Ka17 report peaks At≈10.1 and 10.7 MeV. Γ: 2.0 MeV *3* (1988Bo22), 2.7 MeV *3* (1975Sc33). %EWSR(9-12.5 MeV)=67 (if E2) (1988Bo22). %EWSR(8.0-11.5 MeV)=50 *+15−7* (1987Ki06, from a reanalysis of data of 1981Ku14).
13.6×10³ *2*	1⁻	E(level): from 1977Pi08. Others: 14.1 (1975Sc33), 13400 (1973Na05). Jπ: from 1984CaZT. 1984CaZT report that the strength function agrees to within a few percent with that from (γ,n) data.
14.1×10³ *2*		E(level): from 1972Bu38. Others: 14.2 (1988Bo22), 14.1 (1975Sc33, 1975Na05). %EWSR(12.5-16 MeV)=44% if E0 (1988Bo22).
≈19000		E(level): from 1973Na05. %EWSR=44 if L=3 (1973Na05). E=17500, Γ=4.2 MeV *7* (1974Pi07).
≈22000		E(level): from 1973Na05. %EWSR=60 if L=2 (1973Na05). E=22500, Γ=5 MeV *1*, %EWSR=85 if E2 (1974Pi07).
≈33000		E(level): from 1974Pi07. Γ=6 MeV *1*, %EWSR=150 if L=0 (1974Pi07).

[†] From 1979LiZQ, except where noted otherwise. Authors adopted, for calibration, the values As given for the 2615, 3198, 3709, 3961, 4037, 4085, 4324, and 4424 levels.

[‡] Values given are from Adopted Levels, except where noted otherwise and are given where B(EL) are quoted. Analysis of σ and form factor data by 1979LiZQ and 1982He03 yields Jπ values consistent with the adopted ones. See 1979LiZQ, 1982He03 for a discussion of the possible configurations. Values of 1979Li13, 1979LiZQ, 1980Li04, and 1983HeZT are based on agreement with Hartree-Fock calculation of momentum transfer dependence, σ, and the transverse or longitudinal character of the level.

[#] From 1983HeZT.

[@] From 1978FrZL based on σ(θ) At 50 MeV and 63.5 MeV.

[&] From 1983HeZU.

[a] From 1979Li13.

[b] From 1980Li04.

[c] From 1978Fr06. Jπ is based on σ(θ) At 50 and 63.5 MeV. See also 1975Li19 for σ from 37.5 to 60.5 MeV.

[d] From 1976Fr18.

[e] From 1983HeZT.

[f] From 1983Mu03.

[g] From 1992Co14. J is determined from σ and form factor data. The authors state that the uncertainty for the 6110 peak is 6 keV, but No other uncertainties are given. The evaluator assumes that an uncertainty of 6 keV is appropriate for the other levels As well.

[h] From 1978FrZL.

[i] From 1976Fr18. Author adopted L values for the 2615, 3198, 3709, 4324 and 4424 levels (with known Jπ) for calibration.