^{48}Ca(α,α')   **1967Li13,1965Pe16**

	Type	Author	History Citation	Literature Cutoff Date
	Full Evaluation	Jun Chen	NDS 179, 1 (2022)	30-Nov-2021

1965Pe16,1966Pe16: E=42 MeV α beam from the University of Washington 60-in. cyclotron. Target was 97 μg/cm^2 ^{48}Ca. Scattered particles were detected with silicon detectors (FWHM=110 keV). Measured $\sigma(\theta(\text{c.m.})=12°$ to $65°)$. Deduced levels, J, π, L-transfers, deformation parameters from Austern-Blair model analysis.

1967Li13: E=31 MeV α beam from the MIT cyclotron. Target was $\approx$1 mg/cm^2 metallic 97.98% enriched ^{48}Ca. Scattered particles were detected with a Si surface barrier detector (FWHM=90-100 keV). Measured $\sigma(\theta=15°$ to $70°$, $1.8°)$. Deduced levels, J, π, L-transfers, deformation parameters from DWBA analysis..

1988Fu01,1982Fu02: E=70 MeV. Measured α spectra at $\theta=13°$ and $16°$ to compare with proton spectra for the purpose of the parity assignment. No details are given.

A number of studies have been devoted to anomalous large-angle elastic and inelastic α scattering from ^{48}Ca. Other ^{48}Ca(α,α) reaction mechanism studies have provided information on rms radii of matter and neutron density distributions. See 1983Pe10, 1977Al07, 1975Le19.

^{48}Ca Levels

E(level)[†]	J$^{\pi}$[†]	L[†]	β_L*R(fm)[†]	Comments
0.0	0^+			
3.83×10^3	2^+	2	0.53	β_2=0.13 (1967Li13)
4.29×10^3	$(4^+,5^-)$	(4,5)	0.13,0.12	
4.51×10^3	3^-	3	0.56	
4.61×10^3?[‡]				
5.15×10^3	$3^{-\#}$	3	0.17	
5.30×10^3?[‡]				
5.37×10^3	3^-	3	0.23	
5.48×10^3?[‡]				
5.73×10^3		$5^{@}$		
6.11×10^3	(2^+)	(2)	0.16	
6.34×10^3		$4^{@}$		β_4=0.072 (1967Li13)
6.48×10^3				
6.65×10^3?[‡]		$4^{@}$		β_4=0.065 (1967Li13)
6.75×10^3	2^+	2	0.22	
6.82×10^3?[‡]				
7.05×10^3	(3^-)	(3)	(0.16)	E(level): other: 7.03E+3 (1967Li13).
7.16×10^3?[‡]				
7.53×10^3?[‡]				
7.76×10^3	3^-	3	0.33	
8.33×10^3				

[†] From 1965Pe16, except as noted. R is Austern-Blair interaction radius.
[‡] Reported by 1967Li13 only.
[#] Results are discrepant in the various experiments; see the Adopted Levels for discussion.
[@] From 1967Li13. 1965Pe16 reported L=2, β_LR=0.24 fm for the 5.73 MeV state and L=1, β_LR=0.28 fm for the 6.34 MeV state.