$^{48}\text{Ca}(\alpha,\alpha')$:giant resonance   2011Lu07,2020Ho01

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

2011Lu07: E=240 MeV α beam was provided by Texas A&M University K500 superconducting cyclotron. Scattered α particles were detected with a a multipole-dipole-multipole spectrometer. Measured Eα, $\sigma(\theta_{c.m.}$=2.5° to 40°). Deduced B(E2) for 3832 level, B(E3) for 4507 level, parameters for isoscalar E0, E1, E2 and E3+E4 resonances between 9.5 MeV and 40 MeV giant resonances.

2020Ho01: E=386 MeV α beam was produced from the RCNP accelerator. Scattered α particles were momentum-analyzed with the high-resolution magnetic spectrometer Grand Raiden. Measured Eα, $\sigma(\theta$=5° to 25°). Deduced resonance parameters for isoscalar giant monopole resonance (ISGMR).

^{48}Ca Levels

E(level)[†]	J^π	Width[†]	Comments
3832	2^+		B(E2)↑=0.0140 15 (2011Lu07).
4507	3^-		B(E3)↑=0.0054 8 (2011Lu07).
16.69×10^3[‡] 19		6.2[‡] MeV $+15-1$	E1 resonance. E(level): quoted uncertainty=+19-13. FWHM=6.24 MeV $+149-11$. %EWSR=20 $+12-8$.
16.79×10^3 14		6.95 MeV $+11-35$	E2 resonance. E(level): quoted uncertainty=+14-12. Centroid is 18.61×10^3 $+13-34$ with rms width=7.96 MeV $+36-66$ and %EWSR=83 $+10-16$ from energy moments (2011Lu07). Other: centroid=19.5×10^3 1 and %EWSR=78 $+4-3$ from 2020Ho01. %EWSR=0.65 $+9-11$.
19.88×10^3[#] 18		6.68[#] MeV $+31-36$	E0 (ISGMR) resonance. E(level): quoted uncertainty=+14-18. %EWSR=95 $+11-15$.
20.90×10^3[#] 14		9.34[#] 16	E3+E4 resonance.
37.3×10^3[‡] 20		14.9[‡] MeV $+35-1$	E1 resonance. E(level): quoted value=37.28 MeV $+71-198$. Quoted FWHM=14.95 $+349-11$. %EWSR=160 $+90-50$.

[†] Resonance parameters from Gaussian fits, unless otherwise noted.

[‡] Parameters from a two-peak Gaussian. The centroid is 27.3×10^3 13 with rms width=8.27 MeV 22 and %EWSR (Energy-Weighted Sum Rule)=137 20 from energy moments.

[#] Parameters from energy moments.