

Isoscalar Giant Resonances in Calcium Isotopes Using CDFT and Finite Amplitude Method

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Using the quasiparticle finite amplitude method within covariant density functional theory and the DD-ME2 density-dependent meson-exchange model, we study isoscalar giant resonances in calcium isotopes. Numerical implementation is examined for $^{40-44}\text{Ca}$ and ^{48}Ca , showing good agreement with available experimental isoscalar giant monopole strengths. In the exotic isotopes $^{56-60}\text{Ca}$, we identify the well-known monopole-quadrupole coupling that splits the isoscalar giant monopole resonance and find a soft monopole mode near 16 MeV.