

Search for off-yrast states in n-rich Ca nuclei with DIC

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One of the most investigated issues in nuclear physics is the influence of the N/Z ratio on the structure of the nucleus. In this context, particular interest is given to vibrations and rotations in different isotopic chains both at low and high excitation energies. In a recent PRISMA-CLARA experiment at LNL (Italy) [1] we investigated the population of highly excited states in n-rich Ca nuclei by means of deep-inelastic collisions (DIC) at ≈ 6 MeV/A (≈ 2.5 times above the Coulomb barrier). In these conditions several Ca isotopes have been populated, with a Q-value distribution extending to high energies, as shown in the top panels of figure 1. The on-going analysis concentrates on γ spectra (up to 9 MeV), in order to investigate whether it is possible or not to populate highly-excited states off-yrast, such as those measured in photon scattering experiments [2].

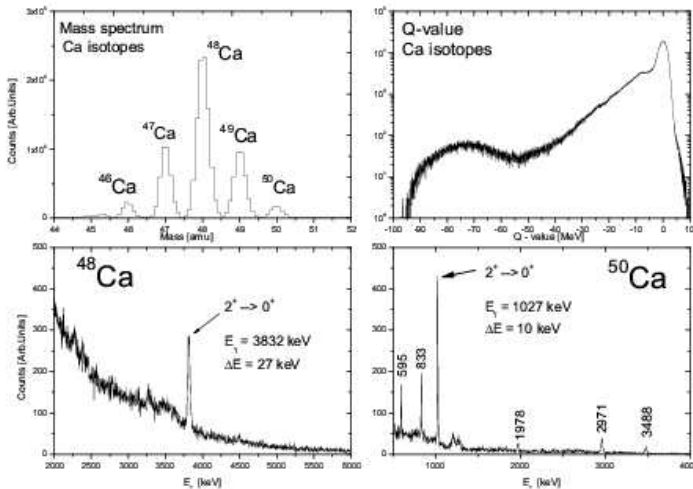


Figure 1: *Top line: mass and Q-value spectra for Ca isotopes, obtained from the reaction ^{48}Ca (at 300 MeV) on ^{64}Ni (≈ 1 mg/cm²). Bottom line: Measured γ spectra in coincidence with ^{48}Ca and ^{50}Ca .*

[1] A.Gadea et al., Eur. Phys. J. A20, 193(2004).

[2] T. Hartmann et al., Phys. Rev. C 65, 034301 (2002).