

Coulomb excitation of neutron-rich ^{44}Ar at SPIRAL

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A low-energy Coulomb excitation experiment on neutron-rich ^{44}Ar has been performed at the SPIRAL facility of GANIL. The primary question addressed by the experiment was the possible weakening of the $N=28$ shell closure in neutron-rich nuclei and, closely connected to that, the development of deformation and shape coexistence in this region of the nuclear chart. A beam of ^{44}Ar was produced by fragmentation of a primary ^{48}Ca beam at 60 A MeV on the carbon production target of SPIRAL. The ^{44}Ar fragments were re-accelerated in the CIME cyclotron to 2.7 and 3.7 MeV/nucleon and Coulomb excited on ^{109}Ag and ^{208}Pb targets, respectively. The scattered projectiles and recoiling target nuclei were detected in a highly segmented double-sided silicon detector and the gamma rays were detected with the EXOGAM germanium detector array.

Apart from the first excited $2+$ state, at least one higher-lying level was populated. The level of statistics is sufficient to determine the gamma-ray yields for several ranges of scattering angles and for the two different target materials. Although the analysis is still in progress, it is anticipated that the collected data will allow extracting the transition probabilities between the observed states, as well as the static quadrupole moment of the first $2+$ state. It is anticipated to continue in this experimental program with the Coulomb excitation of ^{46}Ar .

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