

E1 responses of neutron-rich Ca isotopes ^{50}Ca and ^{52}Ca

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The density dependence of the symmetry energy is one of the keys for understanding the bulk properties of neutron-rich nuclei and astrophysical events, such as supernovae and neutron stars.

Recent theoretical works show that the E1 response of nuclei is well correlated to the density dependence of the symmetry energy close to the saturation density. The dipole polarizability, the inversely energy weighted sum of E1 strength, is pointed out as less model-dependent observable to constrain the density dependence of the symmetry energy. In addition, it is indicated that the low-energy E1 strength up to 10 MeV in ^{52}Ca is well correlated to the density dependence of the symmetry energy. To constrain the symmetry energy with these correlations, the E1 response of ^{50}Ca and ^{52}Ca have been measured by using the relativistic Coulomb excitation.

The experiment was performed using the SAMURAI spectrometer at RIKEN RIBF. The ^{50}Ca and ^{52}Ca beams were impinged on Pb and C targets. The outgoing charged particles and neutrons were measured by SAMURAI spectrometer and the neutron detectors NEBULA and the NeuLAND demonstrator, respectively. The de-excitation gamma-ray from the reaction residue was measured by the gamma-ray detector CATANA.

In this talk, we will report the results obtained for the bound excited states and one-neutron decay channel of ^{52}Ca .

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