

In beam gamma-ray spectroscopy at the RIBF

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In the Radioactive Isotope Beam Factory (RIBF) stable primary beams of energies up to 345 MeV/nucleon are used to produce radioactive isotope beams via in-flight separation with the BigRIPS fragment separator. For in-beam gamma-ray spectroscopy experiments these radioactive beams are incident on a secondary target for Coulomb excitation, inelastic scattering, or knockout reaction measurements. While ejectiles are measured with the ZeroDegree spectrometer, gamma-rays are detected by the NaI(Tl) scintillator based DALI2 array. The first in-beam gamma-ray experiments performed at the RIBF targeted the “Island of Inversion”, a region in which the standard ordering of shells is disturbed by neutron intruder configuration across the N=20 shell gap. Recent experiments include the first spectroscopy of ^{54}Ca , the regions around the doubly-magic ^{78}Ni and $^{100,132}\text{Sn}$ nuclei, as well as investigations on the N=28 shell closure erosion around ^{42}Si . Besides showing (preliminary) selected results from these first experiments and a description of the gamma-ray spectroscopy setup, an outlook on future gamma-ray spectroscopy campaigns at the RIBF including the active liquid hydrogen target MINOS will be given.

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