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INVITED LECTURE - TRIGA-SPEC: an apparatus for high-precision mass spectrometry and laser spectroscopy on short-lived neutron-rich radionuclides produced at the research reactor TRIGA Mainz

Tuesday, 18 September 2012 12:50 (20 minutes)

High-precision measurements of ground-state properties of exotic nuclides such as nuclear binding energies, spins, radii, and moments, can be used to test nuclear models far away from the valley of stability. TRIGA-SPEC, located at the research reactor TRIGA Mainz, aims to investigate the ground-state properties of short-lived fission products produced by thermal-neutron-induced fission of U-235, Pu-239, or Cf-249. These fission products are extracted from the production site with a gas-jet transport system into an ion source, where an ion beam of the radioactive nuclides is formed. Subsequently, the ions are mass separated and prepared in a radiofrequency quadrupole cooler and buncher for the experiments. The high-precision measurements are performed with the Penning-trap mass spectrometer TRIGA-TRAP and by collinear laser spectroscopy with TRIGA-LASER. These experiments serve also as a development platform for MATS and LaSpec at the FAIR facility at GSI. Recent results of the experiments in offline operation and the status of the online coupling to the TRIGA reactor for the radioactive ion beam production are reported.

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