

Recent progress of researches with KISS and MRTOF

Hiroari Miyatake and KISS/MRTOF collaboration

Wako Nuclear Science Center (WNSC), Institute of Particle and Nuclear Studies (IPNS),
High Energy Accelerator Research Organization (KEK), Hirosawa 2-1, Wako, Saitama
351-0198, JAPAN

KISS (KEK Isotope Separation System) project aims at finding an astrophysical condition for synthesizing isotopes of heavy elements under a rapid neutron-capture (r)-process, which forms the third peak in the solar abundance pattern. This is an experimental challenge in nuclear physics to measure ground and isomeric state properties of unknown neutron-rich nuclei around the region of $N=126$ isotones.

So far, we have performed measurements of lifetimes, decay schemes, and hyperfine structures of some platinum, iridium, and osmium isotopes by applying multi-nucleon transfer reactions, in-gas-cell laser ionization, and decay spectroscopic techniques. In this report, I will present recent physics results and updated KISS performance.

In addition to the KISS activities, I will introduce a newly launched project in WNSC. It is concerning a comprehensive mass measurements of isotopes with MRTOF (Multi-Reflection Time-Of-Flight spectrograph). Some of MRTOF's have already been installed not only at KISS but also at Gas-filled Recoil Ion Separator (GARIS II) of Riken RI-Beam Factory (RIBF), the latter of which are going to measure masses of super-heavy isotopes.