



Contribution ID: 61

Type: Oral Presentation

## New energy-degrading scheme for low-energy reaction measurements of rare isotope beams

*Thursday, 14 May 2015 14:30 (20 minutes)*

The recent developments of technique in providing RI beams have been made many advances in radioactive isotope science. The RI beam facility (RIBF) has expanded the variety of nuclides, which provides numerous kinds of exotic isotope beams with  $A > 100$ . However, available beams in RIBF are restricted to an energy region typically above 200 AMeV or stopped beams. The variety of reaction has not been necessarily expanded on this point. The deceleration of intense RI beams provided in RIBF enable the further research based on exotic nuclei/exotic states by probing with transfer reaction in the energy region of few ten MeV, fusion reaction in a few MeV and others.

For this purpose, we has set up OEDO (Optimized Energy Degrading Optics for RI beam) project, which proposes a new energy- degrading scheme of rare isotope beams produced in RIBF by using quadrupole magnets, an RF electric deflector and a mono-energetic degrader. The application of energy degrader is a general method to degrade the beam energy, while it induces the broadening of beam spot due to the angular and momentum aberrations. In the OEDO project, a new beam line is proposed, where an RF electric deflector is employed to cancel the aberrations based on the time structure of the beam bunch corresponding to the velocities of the ions. Simulation has been performed to confirm its feasibility and that the RF deflector achieves a small beam size at a reaction target after energy deceleration to around a few ten MeV. The reaction target is considered to locate at the focal plane following the SHARAQ spectrometer, which enables the low-energy reaction spectroscopy.

Regarding OEDO project, the basic idea, performance study by simulation, design and future plan is introduced in this presentation.

**Primary author:** Dr MATSUSHITA, Masafumi (Center for Nuclear Study, University of Tokyo)

**Co-authors:** Dr IDEGUCHI, Eiji (RCNP, Osaka University); Dr YAMAGUCHI, Hidetoshi (Center for Nuclear Study, University of Tokyo); Dr YAMADA, Kazunari (RIKEN Nishina Center); Dr YAKO, Kentaro (Center for Nuclear Study, University of Tokyo); Dr IMAI, Nobuaki (Center for Nuclear Study, University of Tokyo); Dr MICHIMASA, Shinichiro (Center for Nuclear Study, University of Tokyo); Dr OTA, Shinsuke (Center for Nuclear Study, University of Tokyo); Prof. SHIMOURA, Susumu (Center for Nuclear Study, University of Tokyo)

**Presenter:** Dr MATSUSHITA, Masafumi (Center for Nuclear Study, University of Tokyo)

**Session Classification:** Session 14