OEDO BEAMLINE: NEW ENERGY-DEGRADING ION OPTICS OF RI BEAMS

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In this talk, we will present the new beamline, OEDO, optimized to produce slow-down RI beams at RI Beam Factory in Japan. OEDO is the abbreviation of Optimized Energy-Degrading Optics for RI beams. The beamline was designed to produce slow-down RI beams at less than ~30 MeV/u from intermediate-energy RI beams (~250 MeV/u). By using standard energy-degrading methods, slow-down beams are difficult to achieve both of small beam spot and small energy spread. Because energy degraders are necessary to be installed at momentum dispersive foci to achieve good energy compression. However, such beams are difficult to make beam profile small by static ion transport.

In OEDO, we developed new ion-optical scheme to obtain a small beam profile by using an RF electric deflector. Since the RF deflector has timing structure synchronized with the accelerator, we use it as an ion-optical device to rotate the phase-space ellipse of the beam on the plane of the flight time and the beam angle. Therefore, beamline including an RF deflector enables us obtain small spatial beam profile and consequently we achieve small beam spot at the focus which is suitable for secondary nuclear reaction measurements.

The design of the OEDO beamline was finished. The beamline will be constructed by the upgrade of the High-Resolution Beamline by March, 2017 and the proof-of-principle experiment will be also performed soon afterward.

We will present details on the OEDO beamline in respects to ion-optical design, specifications and upcoming physics experiments.

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