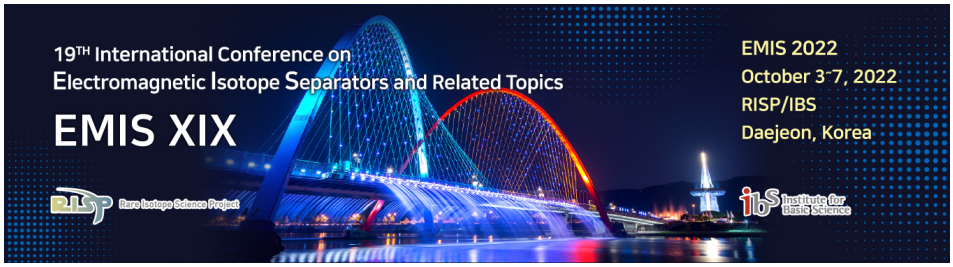

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KoBRA Wien Filter: Specifications and Project Status

Friday, 7 October 2022 11:50 (20 minutes)

A Wien Filter is one of the key components in ion optics also known as a velocity separator. It consists of a dipole magnet generating a magnetic field, and an electrostatic dipole in the gap of the magnet generating an electric field perpendicular to both the magnetic field and the beam axis. The electric and magnetic fields are properly adjusted to obtain expected ion beams with a certain velocity.

Rare Isotope Accelerator complex for ON-line experiments, RAON, is a new RI beam facility in South Korea nearing completion including Korea Broad acceptance Recoil spectrometer and Apparatus, KoBRA, which will produce low-energy radioactive ion beams. KoBRA has been established and tested with radioactive fission source in 2021, and will be commissioned with an ion beam of ~ 20 MeV/nucleon delivered from RAON. One of the main purpose of KoBRA is to separate and to identify low-energy rare isotopes using products from the nuclear reaction such as multi-nucleon transfer.

Recently, a new project at Center for Exotic Nuclear Studies (CENS) has been launched to introduce a Wien Filter in the KoBRA beamline, and this KoBRA Wien Filter (KWF) will play a significant role to enhance the isotope separation performance in beam production of KoBRA. Its specifications were determined based on the optimal ion optics of KoBRA to produce a low-energy beam, especially, the beams less than about 5 MeV/nucleon suitable for nuclear astrophysics experiments. The project is in the manufacturing phase and we expect that it will be installed within 2023.

In this talk, we will present the current status of KWF development and the details of its specifications as well as the ion optics of KoBRA with KWF. We will also discuss about future plans for the RI beam production and separation in KoBRA.

Primary authors: HWANG, Jongwon (Center for Exotic Nuclear Studies, Institute for Basic Science); AHN, Sunghoon(Tony) (Institute for Basic Science); AHN, Deuk Soon (Center for Exotic Nuclear Studies, IBS); KIM, Dahee (Center for exotic nuclear studies, Institute Basic Science); HAHN, Kevin (Ewha Womans University); TSHOO, Kyoungho (RISP/IBS); KWAG, Minsik (RISP)

Presenter: HWANG, Jongwon (Center for Exotic Nuclear Studies, Institute for Basic Science)

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