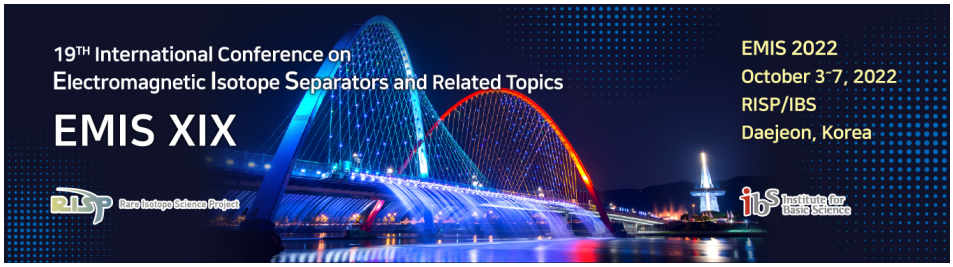

Contribution ID: **94** Type: **Oral Session**

Commissioning results of ISOL beam lines with ^{133}Cs and ^{120}Sn beams at Rare Isotope Science Project

Tuesday, 4 October 2022 14:50 (20 minutes)

Radioactive isotope (RI) beam techniques are expanding the playing field of nuclear physics, and new insight of nuclei are given by continuously experimental and theoretical efforts. Reaccelerated RI beams based on ISOL technique is informative for more precise measurements with high statistics, because these beams have both of excellent quality and high intensity. In addition, such RI beams are utilized to RI productions, the playing field can be expanded to more exotic region. Very low-energy RI beams extracted from ISOL are also convenient for not only nuclear physics but also material science and cancer therapy. For these purposes, we are developing a high power ISOL facility.

ISOL system at Rare Isotope Science Project (RISP) consists of a proton cyclotron, a target ion source (TIS), a pre-mass separator, a radio frequency quadrupole cooler buncher (RFQCB), an electron beam ion source (EBIS) charge breeder, and an A/q separator. Experimental Physics and Industrial Control System (EPICS) was adopted for the ISOL control system as a standard framework. Construction of the system and optical components alignment were completed on 2020, and now is commissioning with stable ion beams. Since we developed a surface ionization ion source and a Laser ion source, the commissioning combining all devices is performed by using ^{133}Cs, and ^{120}Sn beams from the TIS. As a result, we found the pre-mass separator beam line setting condition with required mass resolving power (> 400) and 100% beam transmission efficiency. Although the beam commissioning of the A/q separator is undergoing, the beam was able to transport from the TIS to the end of ISOL beam line, that is the entrance of RFQ accelerator system.

In this presentation, the beam commissioning results for the pre-mass separator and the A/q separator will be reported. In addition, future test plans and schedule will be discussed.

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Session Classification: Session 7