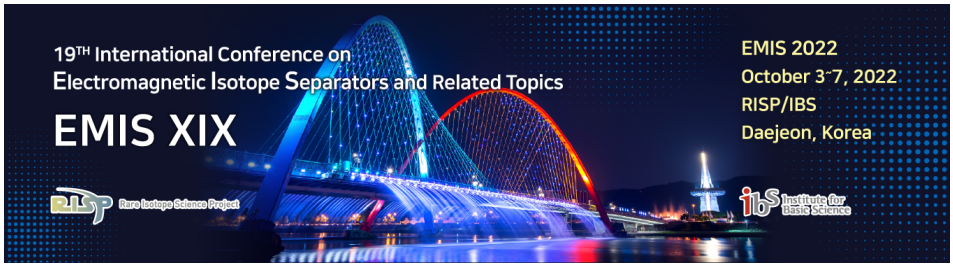

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Development of a Reference Trap to Diagnose RFQ-CB of the heavy ion accelerator RAON

Monday, 3 October 2022 21:10 (8 minutes)

The Radio Frequency Quadrupole Cooler Buncher (RFQ-CB) of the heavy ion accelerator RAON is a device that cools the incoming ion beam and sends it out in the form of a bunch. In order to analyze the trapped ions and improve the performance of the RFQ-CB, we built a reference trap which is the miniaturized version of RFQ-CB. The reference trap consists of RF and DC electrodes in an octagon chamber, a helium supply system, viewports, and a Ba+ ion source to make a condition similar to RFQ-CB. Because Ba+ ion has strong electric dipole transition at visible wavelength (455 nm), an extended cavity diode laser (ECDL) will be used to make fluorescence from the trapped ion bunch and eventually measure the temperature of the cooled ions. Imaging of the ion bunch with precise timing will be developed to analyze the performance of the RFQ-CB at various helium buffer gas pressure and RF/DC voltage. The development details of our reference trap will be presented at the conference.

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