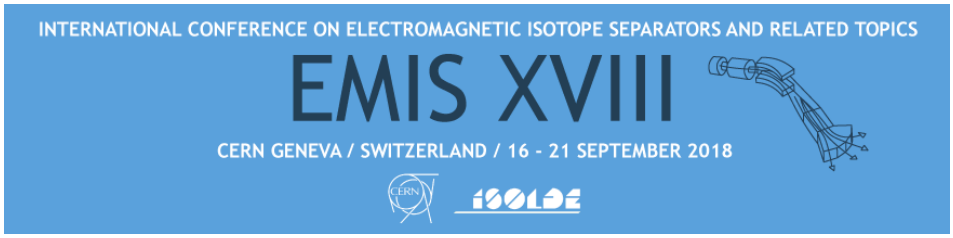

Contribution ID: **113** Type: **Poster**

Electron beam ion source for the re-acceleration of rare-isotope ion beams at TRIUMF

Monday 17 September 2018 18:00 (1 minute)

TRIUMF is enhancing its rare isotope production capabilities by creating a new scientific infrastructure known as the Advanced Rare IsotopE Laboratory (ARIEL). A critical part of this expansion is the CANadian Rare-isotope facility with Electron-Beam ion source (CANREB) project which combines a high-resolution separator, a gas-filled radiofrequency quadrupole (RFQ) cooler and buncher, a pulsed drift tube (PDT), an electron beam ion source (EBIS) charge-breeder, and a Nier-type magnetic spectrometer to deliver pure rare isotope beam for post-
acceleration.
The CANREB-EBIS was developed at the Max Planck-Institut fur Kernphysik (MPIK) in Heidelberg and uses electron beam driven ionisation to produce highly charged ions (HCI) in a few, well-defined charge states. Singly charged ions from the RFQ are injected into a longitudinal electrostatic trap and are then tightly, radially confined by the spacecharge potential of a maximally focussed electron beam current. To date, the maximum electron beam current achieved is 1 A with a density in excess of 5000 Acm^{-2} by means of a 6 T axial magnetic field. It is expected that during operation HCI bunches of up to 10^7 ions are extracted at a repetition rate of 100 Hz with an A/Q in the range 4-7 which is required for re-acceleration at the ARIEL or ISAC facility. We present here the CANREB-EBIS design and results from the commissioning runs at MPIK and TRIUMF, including X-ray diagnostics of the electron beam and charge-breeding process, as well as ion injection and HCI-extraction measurements.

Authors: Dr GRAHAM, Leigh (TRIUMF); DILLING, Jens (triumf/UBC); AMES, Friedhelm (TRIUMF); BARQUEST, Brad (TRIUMF); Dr CRESPO LÓPEZ-URRUTIA, José R. (Max-Planck-Institut für Kernphysik); Dr HUBELE, Renate (Max Plank institute fur kernphysik); Mr BLESSENOHL, Michael (Max Plank Institute fur Kernphysics); Mr DOBRODEY, Stephan (Max Plank Institute fur Kernphysics); Mr WARNECKE, Christian (Max plank Institute Fur Kernphysiks); Mr ROSNER, Michael (Max Plank Institute Fur Kernphysics)

Presenter: Dr GRAHAM, Leigh (TRIUMF)

Session Classification: Poster Session 1

Track Classification: Isotope production, target and ion source techniques