NWS16-2016-000083

Abstract for an Invited Paper
for the NWS16 Meeting of
the American Physical Society

Progress With The Titan Mass Spectrometer

DANIEL LASCAR, TRIUMF

TITAN consists of several ion traps that manipulate and study exotic, short-lived nuclei. TITAN has measured the masses of the shortest-lived nuclides ever investigated, using the technique of time-of-flight ion cyclotron resonance. To support precision measurements, TITAN deploys an Electron Beam Ion Trap (EBIT), a Cooler PEnning Trap (CPET) and a Multi-Reflection Time-of-Flight mass spectrometer (MR-ToF). The latter two are being commissioned offline while the EBIT is in operation and charge-breeds ions before sending them to the precision Penning trap for mass measurements. The EBIT has demonstrated the recapture of beta-decay daughters and can be used as an ion source for elements not produced at TRIUMF's ISAC facility. Recently, the EBIT's emittance properties have been improved so transfer efficiency between the EBIT and the Penning trap has subsequently improved. CPET has demonstrated the capture and self-cooling of a plasma of 10^9 electrons, and is being altered to accommodate anti-parallel beams of electrons and positively charged ions for simultaneous trapping. MR-ToF's commissioning has proceeded to the point where it can demonstrate a mass resolving power >8E4.

In collaboration with: (TRIUMF) C. Babcock, B. Barquest, At Gallant, M. Good, J. Dilling, (MANITOBA) U. Chowdhury, B. Kootte, G. Gwinner, (UBC) A. Finaly, Y. Lan, E. Leistenschneider, (SURREY) M. Foster, (MPIK) R. Klawitter, (GSI) MP Reiter, (SFU) D. Short, C. Andreiou