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Trapping in TITANs Cooler Penning Trap BRIAN KOOTTE, TRIUMF/University of Manitoba, DANIEL LASCAR, TRIUMF, STEFAN PAUL, University of Heidelberg, GERALD GWINNER, University of Manitoba, JENS DILLING, TRIUMF/University of British Columbia, TITAN COLLABORATION
— Penning trap mass spectrometry provides an excellent means of determining the masses of nuclei to high precision.Highly Charged Ions (HCIs) have been successfully used at TRIUMFs Ion Trap for Atomic and Nuclear science (TITAN) to enhance the precision of mass measurements for short-lived species. The gain in precision can theoretically scale with the charge state of the ion, but recent measurements of beam properties have shown that the process of charge breeding ions to higher charge states increases the energy spread of the ion bunch sent to the Penning trap. This reduces the gain from using HCIs. In order to maximize the precision of mass measurements, we are currently performing offline commissioning of a Cooler PEnning Trap (CPET) with the purpose of sympathetically cooling HCI bunches to an energy of ˜1 eV/q using a plasma of electrons. This will require implementing a nested potential configuration to trap the ions and electrons in the same region so they can interact via coulomb scattering. Recent progress in testing the trapping of electrons and singly charged ions in CPET, leading towards the cooling of HCIs prior to mass measurements in TITANs will be discussed.

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