

Abstract Submitted
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A Cooler Trap for the TITAN On-line Trapping Facility at TRIUMF G. GWINNER, Z. KE, W. SHI, S. TOEWS, University of Manitoba, Winnipeg, Canada, J. DILLING, V. RYJKOV, TRIUMF, Vancouver, Canada — The TITAN ion trap facility currently under construction at TRIUMF's ISAC will provide for the first time highly charged radioactive ions for precision mass measurements. Highly charged ions (HCI) extracted from the EBIT charge breeder will likely have a temperature of tens of eV/charge or more, too high for direct injection into the precision Penning trap mass spectrometer. We are currently developing an intermediate Penning cooler trap to pre-cool the HCI prior to the mass measurement. One possible route is electron cooling, where the HCI interact with a cloud of electrons, which self-cool via the emission of synchrotron radiation in the strong magnetic field of the Penning trap; another possibility is sympathetic cooling with initially cold protons provided by a cold ion source. We will present simulations of the cooling process, including the potentially detrimental effects of radiative, dielectronic, and three-body recombination. We will also present our preliminary design for a cooler Penning trap which can accommodate both electron and proton cooling.

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