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Abstract Submitted
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Shaping of nested potentials for electron cooling of highly-charged ions in a cooler Penning trap STEFAN PAUL, University of Heidelberg, Heidelberg, Germany, BRIAN KOOTTE, University of Manitoba, Winnipeg, MB, Canada, DANIEL LASCAR, TRIUMF, Vancouver, BC, Canada, GERALD GWINNER, University of Manitoba, Winnipeg, MB, Canada, JENS DILLING[1], TRIUMF, Vancouver, BC, Canada, TITAN COLLABORATION — TRIUMF's Ion Trap for Atomic and Nuclear science (TITAN) is dedicated to mass spectrometry and decay spectroscopy of short-lived radioactive nuclides in a series of ion traps including a precision Penning trap. In order to boost the achievable precision of mass measurements TITAN deploys an Electron Beam Ion Trap (EBIT) providing Highly-Charged Ions (HCI). However, the charge breeding process in the EBIT leads to an increase in the ion bunch's energy spread which is detrimental to the overall precision gain. To reduce this effect a new cylindrical Cooler PEnning Trap (CPET) is being commissioned to sympathetically cool the HCI via a simultaneously trapped electron plasma. Simultaneous trapping of ions and electrons requires a high level of control over the nested potential landscape and sophisticated switching schemes for the voltages on CPET's multiple ring electrodes. For this purpose, we are currently setting up a new experimental control system for multi-channel voltage switching. The control system employs a Raspberry Pi communicating with a digital-to-analog board via a serial peripheral interface. We report on the implementation of the voltage control system and its performance with respect to electron and ion manipulation in CPET.

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