Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Solenoid Transport of an Intense Ion Beam J.E. COLEMAN, E. HENESTROZA, P.K. ROY, W.L. WALDRON, J. ARMIJO, D. BACA, P.A. SEIDL, LBNL, Berkeley, CA 94720, USA, I. HABER, University of Maryland, College Park, MD 20742, U.S.A., W.M. SHARP, J.L. VAY, LLNL, Livermore, California 94550, USA, D.R. WELCH, Voss Scientific, Albuquerque, NM 87108, USA, THE HEAVY ION FUSION SCIENCE VIRTUAL NATIONAL LABORATORY COLLABORATION — Future WDM and HEDP experiments may use solenoids for transverse focusing of low energy, space-charge dominated ion beams during acceleration. An experiment to transport a 10 μs long, singly charged potassium ion bunch at an ion energy of 0.3 MeV and current of 45 mA through a solenoid lattice (STX) has been commissioned at LBNL. The beam should establish a Brillouin-flow condition, particle rotation at the Larmor frequency, with fields greater than 2T. The principal objectives of the STX are to match and transport the space-charge dominated ion beam and to study mechanisms that would degrade beam quality such as focusing-field aberrations, beam halo, spacing of lattice elements, and electron-cloud and gas effects. A qualitative comparison of experimental and calculated results are presented, which include time resolved transverse phase-space of the beam at different diagnostic planes throughout the focusing lattice, beam current density and beam-induced gas desorption, ionization and electron effects. (This work was supported by the U.S. D.O.E. under DE-AC02-05H11231)

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Date submitted: 21 Jul 2006 Electronic form version 1.4