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Abstract. 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 $\mu$s 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.

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