

Abstract Submitted
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Recent Results on the Study of Transverse Beam Dynamics Using the Laser-Induced-Fluorescence Diagnostic on the Paul Trap Simulator Experiment (PTSX)¹ HUA WANG, ERIK GILSON, RONALD DAVIDSON, PHILIP EFTHIMION, RICHARD MAJESKI, Princeton Plasma Phys Lab — The Paul Trap Simulator Experiment (PTSX) is a compact Paul trap that simulates the nonlinear transverse dynamics of an intense charged particle beam propagating through an equivalent kilometers-long magnetic alternating-gradient (AG) focusing system. The recently developed laser-induced-fluorescence (LIF) diagnostic allowed us to measure the time dependent, transverse phase space profiles of the charge bunch and better understand critical issues in charged particle beam dynamics including emittance growth, and halo particle formation. The LIF diagnostic system includes an excimer laser, a dye laser, a CCD camera system and a stable high-density barium ion source. The measurements of the radial density profiles of the barium ion source using the LIF diagnostic are calibrated and compared to measurements using a charge collector. The design of the new barium ion source and the LIF diagnostic system will be discussed. The initial results of the radial density profiles measured by the LIF diagnostic will be presented.

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