

Abstract Submitted  
for the DPP08 Meeting of  
The American Physical Society

**Ion Source and Laser-Induced Fluorescence Diagnostic System Development for the Paul Trap Simulator Experiment<sup>1</sup>** H. WANG, M. CHUNG, R.C. DAVIDSON, M. DORF, P.C. EFTHIMION, E.P. GILSON, R. MAJESKI, E.A. STARTSEV, Princeton Plasma Physics Laboratory, N. THOMAS, Massachusetts Institute of Technology, A. ARORA, Cornell University — The Paul Trap Simulator Experiment (PTSX) is a cylindrical Paul trap that simulates the nonlinear dynamics of intense charged particle beam propagation in an alternating-gradient magnetic transport system. Cesium has been used as the ion source in the initial phase of PTSX for its operational convenience, as well as its favorable stability. However, the cesium source is to be replaced by a barium source in order to develop a laser-induced fluorescence (LIF) diagnostic to study the ion density profile and ion velocity distribution function. The features of the cesium and barium sources are presented. The feasibility of the LIF diagnostic using the barium source and the development of the LIF diagnostic system are also discussed, including the installation of an excimer-pumped dye laser to allow a variety of fluorescence schemes to be pursued.

<sup>1</sup>This research is supported by the U. S. Department of Energy.

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Date submitted: 20 Jul 2008

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