

Abstract Submitted  
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**Development of Barium Ion Source for the Paul Trap Simulator Experiment**<sup>1</sup> MOSES CHUNG, ERIK P. GILSON, RONALD C. DAVIDSON, PHILIP C. EFTHIMION, RICHARD MAJESKI, Princeton Plasma Physics Laboratory — A barium ion source has been developed for the laser-induced fluorescence (LIF) measurement of the transverse ion density profile in the Paul Trap Simulator Experiment (PTSX). The PTSX device is a cylindrical Paul trap whose purpose is to simulate the nonlinear dynamics of intense charged particle beam propagation in alternating-gradient magnetic transport systems. Barium ions are produced at a hot platinum surface with a high work function by surface ionization. Although there are several transition lines for the laser excitation of barium ions, transition from the metastable state  $5^2D_{3/2}$  to the excited state  $6^2P_{1/2}$  is considered mainly because there exists a commercially available, stable, broadband, high-power laser system in this region of the red spectrum. The ion source is composed of a barium reservoir, platinum ionizer, and extracting electrode system. Initial bench-test results, final design, and installation of the barium ion source will be presented.

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