

LASER INDUCED FLUORESCENCE DIAGNOSTIC OF BARIUM ION PLASMAS IN THE PAUL TRAP SIMULATOR EXPERIMENT*

Moses Chung, Erik P. Gilson, Ronald C. Davidson, Philip C. Efthimion,
Richard Majeski, Edward A. Startsev, PPPL, P.O. Box 451, Princeton, NJ,
08543-0451

The Paul Trap Simulator Experiment (PTSX) 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. To investigate the ion plasma microstate in PTSX, including the ion density profile and the ion velocity distribution function, a laser induced fluorescence diagnostic system is being developed as a non-destructive diagnostic. Instead of cesium, which has been used in the initial phase of the PTSX experiment, barium has been selected as the preferred ion for the laser induced fluorescence diagnostic. A feasibility study of the laser induced fluorescence diagnostic using barium ions is presented with the characterization of a tunable dye laser. The installation of the barium ion source and the development of the laser induced fluorescence diagnostic system are also discussed.

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