Abstract Submitted
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Xenon ion Laser-Induced Fluorescence using a tunable diode laser near 680nm[1] GREG SEVERN, Dept. of Physics, University of San Diego, DONG-SOO LEE, NOAH HERSHKOWITZ, University of Wisconsin-Madison, UW-USD COLLABORATION — Xe ion laser-induced fluorescence (LIF) measurements in low temperature Xe II plasmas ($T_e \sim 1eV, T_i \sim 1/40eV$,$n_i \sim 10^9$ cm^{-3}) have been achieved. The transition studied involves the metastable state $(^3P_1)5d[3]_{7/2}$, at 108423.07 cm^{-1}. The excited states that compose this LIF scheme, which involve excitation at 680.574nm (air) and fluorescence at 492.15nm (air), have been misidentified in the past. This is due in part to the realization that the energy level structure of Xe II is somewhat better described by jk coupling than by LS coupling. LIF measurements of a room temperature iodine gas cell were used to monitor the wavelength of the laser during the measurements, and these are compared with the molecular iodine absorption spectrum measurements of Gerstenkorn & Luc and of Salami and Ross. These studies have permitted measurements of the ion velocity distribution functions for both ions in a two ion species, Ar+Xe plasma, something never before accomplished, so as to make possible the first experimental test of the Generalized Bohm Criterion.

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