

Abstract Submitted  
for the DPP10 Meeting of  
The American Physical Society

**LIF diagnostic for flow shear instability studies at the NRL SPSC**<sup>1</sup> CHRISTOPHER COTHRAN, ERIK TEJERO, Global Strategies Group (North America), BILL AMATUCCI, U. S. Naval Research Laboratory — An ongoing series of experiments at the Naval Research Laboratory Space Physics Simulation Chamber (NRL SPSC) has investigated ion cyclotron instabilities due to sheared plasma flow. Both electrostatic and, most recently, electromagnetic instabilities have been observed (see E. Tejero *et al.*, this conference). A three axis laser induced fluorescence (LIF) diagnostic is being constructed for direct measurement of the flow layer profile, which previously has been inferred from electric field measurements. The spatial resolution (2mm) will be sufficient to observe the ion gyroscale flow shear. This diagnostic uses a singly ionized Argon level scheme: a 500mW diode laser pumps the transition at 668nm and fluorescence is observed at 442nm.

<sup>1</sup>Research supported by the Office of Naval Research.

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Date submitted: 16 Jul 2010

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