Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Laser Induced Fluorescence Diagnostic for the Plasma Couette Experiment NOAM KATZ, U. Wisconsin-Madison, FRED SKIFF, U. Iowa, CAMI COLLINS, DAVE WEISBERG, JOHN WALLACE, MIKE CLARK, KRISTINE GAROT, CARY FOREST, U. Wisconsin-Madison — The Plasma Couette Experiment (PCX) at U. Wisconsin-Madison consists of a rotating high-beta plasma and is well-suited to the study of flow-driven, astrophysically-relevant plasma phenomena. PCX confinement relies on alternating rings of 1kG permanent magnets and the rotation is driven by electrode rings, interspersed between the magnets, which provide an azimuthal ExB. I will discuss the development of a laser-induced fluorescence diagnostic (LIF) to characterize the ion distribution function of argon plasmas in PCX. The LIF system–which will be scanned radially–will be used to calibrate internal Mach probes, as well as to measure the time-resolved velocity profile, ion temperature and density non-perturbatively. These diagnostics will be applied to study the magneto-rotational instability in a plasma, as well as the buoyancy instability thought to be involved in producing the solar magnetic field. This work is supported by NSF and DOE.

Noam Katz
U. Wisconsin, Madison

Date submitted: 15 Jul 2010 Electronic form version 1.4