Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Laser Induced Fluorescence Measurements of Argon Neutrals in Two Helicon Sources AMY KEESEE, DUSTIN MCCARREN, EARL SCIME, West Virginia University — A laser induced fluorescence (LIF) scheme to measure velocity distribution functions (VDFs) of argon neutrals was previously developed by the West Virginia University helicon source group [*Keesee et al.*, 2004]. The original measurements were performed with a low power, < 15 mWatt, diode laser with a limited tuning range centered on the 667.9125 nm (vacuum wavelength) pump wavelength. To obtain a sufficient population in the initial, non-metastable state, the helicon source had to be operated at fill pressures greater than 10.5 mTorr. Here we present new neutral VDF measurements with an amplified tunable diode laser (up to 350 mWatts) capable of scanning over 25 GHz. With this new laser, we have been able to obtain neutral VDF measurements over a broader range of pressures in our large helicon plasma source as well as obtain measurements in the recently upgraded and much smaller CHEWIE helicon source. In addition to measurements of the neutral temperature, we will present measurements of the bulk neutral flow for plasma conditions that result in the formation of an electric double layer which produces an ion beam in an expanding helicon plasma.

Amy Keesee
West Virginia University

Date submitted: 13 Jul 2011 Electronic form version 1.4