

Abstract Submitted  
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**Continuous wave cavity ring down spectroscopy measurements of ion velocity distribution functions in argon helicon plasma** SAIKAT CHAKRABORTY THAKUR, West Virginia University, JERRY CARR JR., DUSTIN MCCARREN, MATTHEW GALANTE, ALEX HANSEN, EARL SCIME, HELICON SOURCE GROUP TEAM — The West Virginia University helicon source group routinely employs laser induced fluorescence (LIF) to measure velocity distribution functions (VDFs) of argon ions, argon neutrals, helium neutrals and xenon ions. We are developing a continuous wave cavity ring down spectroscopy (CW-CRDS) diagnostic with a narrow linewidth, tunable diode laser as an alternative technique to measure VDFs in species where LIF is inapplicable. Being an ultra-sensitive, cavity enhanced absorption spectroscopy technique, CRDS can also provide a direct measurement of the absolute metastable state density. Here we present Ar II ion VDFs obtained through measurements of the Doppler broadened absorption spectrum of Ar II at 668.614 nm (in vacuum), a standard initial state for conventional Ar II LIF.

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