

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Continuous Wave Ring-Down Spectroscopy Diagnostic for Measuring Argon Ion and Neutral Velocity Distribution Functions in a Helicon Plasma DUSTIN MCCARREN, ROBERT VANDERVORT, MARK SODERHOLM, JERRY CARR JR., MATTHEW GALANTE, RICHARD MAGEE, EARL SCIME, West Virginia University — Cavity Ring-Down Spectroscopy CRDS is a proven, ultra-sensitive, cavity enhanced absorption spectroscopy technique. When combined with a continuous wavelength (CW) diode laser that has a sufficiently narrow line width, the Doppler broadened absorption line, i.e., the velocity distribution functions (IVDFs), can be measured. Measurements of IVDFS can be made using established techniques, such as laser induced fluorescence (LIF). However, LIF suffers from the requirement that the initial state of the LIF sequence have a substantial density. This usually limits LIF to ions and atoms with large metastable state densities for the given plasma conditions. CW-CRDS is considerably more sensitive than LIF and can potentially be applied to much lower density populations of ion and atom states. In this work we present ongoing measurements of the CW-CRDS diagnostic and discuss the technical challenges of using CW-CRDS to make measurements in a helicon plasma.

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Date submitted: 09 Jul 2013

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