

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Absorption Spectroscopy of Helium Ions in a Helicon Plasma Source RYAN MURPHY, IOANA BILOIU, MIKE SPENCER, ROBERT HARDIN, EARL SCIME, West Virginia University — The scarcity of strong absorption lines in accessible tuning ranges along with plasma saturation due to low ion population densities makes absorption spectroscopy of helium ions notoriously difficult. Helicon plasmas, with their characteristically high ion densities are a good candidate for initial helium ion spectroscopy experiments. Initial measurements of Doppler broadened ion velocity distribution functions (ivdf) involve injecting a tunable infrared diode laser, tuned to 1012.36 nm and chopped roughly at 1kHz, along the axis of a 1.5m long helicon plasma. Two passes through the plasma were used before the intensity was recorded with a bandpass filtered photodiode. This allowed for sufficient absorption to obtain the ivdf measurement, but eliminated the spatial resolution of the diagnostic. Recent measurements using a single pass through the plasma and additional filters to reduce the laser intensity will be presented in this work. The design of the apparatus and improved measurements of the line integrated ivdf will be presented.

Ryan Murphy
West Virginia University

Date submitted: 15 Jul 2005

Electronic form version 1.4