Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Microwave Assisted Helicon Source Plasma JOHN MCKEE, ROBERT VANDERVORT, MARK SODERHOLM, DUSTIN MCCARREN, EARL SCIME, West Virginia University — Helicon plasma sources are an efficient method by which plasmas of relatively high densities can be produced. However, the temperature of these plasmas is comparatively low. Electron temperatures are often only a few eV, with ion temperatures being a factor of ten below that. These temperatures are too low to study ion behavior in lighter noble gases, such as helium, using laser induced fluorescence (LIF) schemes as the energy difference between the ion ground state and excited levels is typically tens of eV. To bridge this energy divide, a 1.2 kW source of 2.45 GHz microwaves is used in addition to the normal rf helicon source. Through electron cyclotron resonance (ECR) heating, the electron temperature is raised and low lying ion energy states are populated. Here we present spectroscopic measurements of microwave assisted helium plasmas.

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Date submitted: 10 Jul 2014 Electronic form version 1.4