Abstract Submitted
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Neutral density measurements in a microwave generated plasma with varying fractional ionization[1] ELEANOR WILLIAMSON, IVAN ARNOLD, DAVID ENNIS, GREGORY HARTWELL, CURT JOHNSON, STUART LOCH, DAVID MAURER, Auburn University — Understanding the transition region between fully ionized and neutrally dominated plasmas is important to the study of the magnetosphere of the earth, the corona/chromosphere transition regions of the sun, and detached divertors in stellarators. Precisely characterizing the fractional ionization of the plasma requires accurately measuring neutral density. We explore the use of an absolutely calibrated spectrometer, a triple probe, and an interferometer to measure the neutral density, electron density, and electron temperature of argon plasmas in a Compact Toroidal Hybrid heated by ECRH with up to 2 kW of input power. The electron temperatures range from 5 eV to 10 eV and the electron densities from 1 x 10^{17} m^{-3} to 10 x 10^{17} m^{-3}. The radial profiles of the electron temperature and density are relatively flat over the minor cross section of the plasma. Results will be presented from a study of the fractional ionization within the plasma volume and an analysis of the argon metastable and ion populations.

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