

Abstract Submitted  
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**SOL Electron Temperature and Density Profiles using Ratios of Minority Helium-I Emission in ICRH-heated Tokamak Discharges on TEXTOR**<sup>1</sup> E.A. UNTERBERG, ORNL, O. SCHMITZ, H. STOSCHUS, FZ-Juelich, D.H. FEHLING, C.C. KLEPPER, D.L. HILLIS, ORNL, J.M. MUNOZ-BURGOS, ORISE, G. VAN WASSENHOSE, LPP-ERM/KMS — Characterizing the scrape-off layer (SOL) and last-closed-flux-surface (LCFS) region around an ion cyclotron resonant heating (ICRH) launch antenna during high-power RF heating of tokamak discharges is needed to better understand the heating mechanisms on the core plasma. A new diagnostic that uses a 1-D array of filtered photomultiplier tubes has recently been installed in front of an ICRH antenna on TEXTOR. This diagnostic uses narrow-bandpass (10Å) visible filters to isolate various emission lines of helium-I. The helium is a minority species (< 1%) of an otherwise pure (~ 98%) deuterium discharge. Using this data and an enhanced collisional-radiative model, the electron density and temperature are determined at high spatial (~ 1 mm) and temporal (down to 1 ms) resolution. Simultaneous profiles of electron temperature and density from ~ 1cm in front of the antenna out to ~2-3cm inside the LCSF have been obtained – giving a ~ 5cm full profile. Details of the diagnostic technique and profile data from discharges with ICRH power up to 1.2 MW will be shown.

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