

Abstract Submitted  
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**Space resolved XUV/VUV spectroscopy of low temperature plasmas**<sup>1</sup> DEEPAK KUMAR, ALEXANDER ENGLSBE, MATTHEW PARMAN, DAN STUTMAN, MICHAEL FINKENTHAL, Johns Hopkins University, ERIC HOLLMANN, BENJAMIN HUDSON, University of California, San Diego — Transmission grating based survey imaging spectrometers in the XUV/VUV have been developed for diagnosing tokamak divertor and edge. The XUV and the VUV spectrometers had moderate spectral resolution ( $\lambda/\delta\lambda \sim 30$ ), but wide spectral range (30 – 800 Å for the XUV, 100 – 2000Å for the VUV). The XUV(VUV) spectrometer covered an angular view of  $\pm 3.5^0(\pm 1.6^0)$  with a  $0.45^0(0.2^0)$  resolution. These spectrometers were tested on two different low temperature plasma experiments - (a) A Penning ionization discharge (PID) at JHU ( $n_e \sim 10^{19}/\text{m}^3, T_e \sim 1\text{eV}$ ) and (b) The PISCES-A linear plasma experiment at UCSD ( $n_e \sim 10^{18}/\text{m}^3, T_e < 6\text{eV}$ ). Distinct radial emission profiles were measured in both the experiments from a variety of ions: H, He, C, Ne and Al. For most ions, higher charge states were observed on the PID than on PISCES-A. For example upto  $\text{Al}^{+3}$  and  $\text{Ne}^{+3}$  were observed on the PID and only upto 2 times ionized Al and Ne were observed on PISCES-A. This may be attributed to the presence of non-Maxwellian electrons in the PID. However, the PISCES-A experiment observed up to  $\text{C}^{+2}$ , while only  $\text{C}^{+1}$  was observed on the PID. This poster will present the experimental spectra and the related modeling.

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