

Abstract Submitted  
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**Installation of Lyman Alpha Pinhole Cameras on DIII-D and Initial Measurements of Main Chamber Neutrals<sup>1</sup>** AARON ROSENTHAL, Plasma Science and Fusion Center, MIT, ALESSANDRO BORTOLON, Princeton Plasma Physics Lab, JERRY HUGHES, Plasma Science and Fusion Center, MIT, FLORIAN LAGGNER, Princeton Plasma Physics Lab, THERESA WILKS, RUI VIEIRA, Plasma Science and Fusion Center, MIT — A one dimensional hydrogen Lyman-alpha ( $\text{Ly-}\alpha$ ) edge diagnostic was recently installed and commissioned on the DIII-D tokamak. The system consists of two cameras, one viewing the low field and the other the high field side of the tokamak, each providing a toroidal fan of twenty lines of sight covering the scrape off layer and pedestal region below the midplane. Each camera has an aperture,  $\text{Ly-}\alpha$  reflective mirror,  $\text{Ly-}\alpha$  transmission filter, and AXUV detector array providing a radial resolution of 8 mm with a total coverage of 214 mm. The system was aligned on the bench and its positioning verified in vessel using a coordinate measuring machine, accurately matching the design parameters without the need of in vessel laser alignment. The  $\text{Ly-}\alpha$  camera began taking data early in the 2019 DIII-D experiment campaign, providing an improved characterization of neutrals by measuring the  $\text{Ly-}\alpha$  brightness. Using standard rate coefficients and electron density and temperature profiles, brightness profiles can be inverted to obtain  $\text{Ly-}\alpha$  emissivity profiles, which can yield atomic deuterium and ionization rate profiles. Installation, alignment, initial data analysis, and preliminary results will be discussed.

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