

Abstract Submitted  
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**High spatial resolution density fluctuation measurements of DIII-D pedestal turbulence**<sup>1</sup> MAXIMILLIAN MAJOR, LUCAS MORTON, ZHENG YAN, DAVE SMITH, GEORGE MCKEE, University of Wisconsin - Madison, GENERAL ATOMICS - UNIVERSITY OF WISCONSIN - MADISON COLLABORATION — Localized 2D measurements of density fluctuations in the H-mode pedestal of DIII-D plasmas reveal a range of broadband modes that vary temporally and spatially during the inter-ELM cycle. These measurements are obtained with Beam Emission Spectroscopy and a new higher radial resolution Charge eXchange Imaging (CXI) prototype diagnostic. Fluctuation characteristics will be presented as a function of  $q_{95}$ , electron temperature, triangularity, and collisionality, which have been predicted to impact the growth rate of pedestal instabilities, including microtearing modes (MTM). MTMs are predicted to cause electron thermal transport in the pedestal and other regions of high-beta plasmas. CXI will measure carbon density fluctuations at the pedestals and complement the Beam Emission Spectroscopy (BES) diagnostic, with up to 3x improved spatial resolution. This will enhance sensitivity to fluctuations localized to the narrow pedestal range, enabling the detection of MTMs and the dynamics in between ELMs. Preliminary analysis of prototype CXI data indicates enhanced coherency at higher frequencies when compared to BES along with higher sensitivity to density fluctuations.

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