

Abstract Submitted
for the GEC18 Meeting of
The American Physical Society

High frequency ion fluctuation measurements using laser-induced fluorescence¹ R. HOOD, S. D. BAALRUD, R. L. MERLINO, F. SKIFF, University of Iowa — We present ion fluctuation spectra, resolved spatially through the presheath region of a positively biased electrode using a recently developed field programmable gate array (FPGA)-based laser-induced fluorescence (LIF) system [1]. The system is able to measure ion fluctuation spectra up to 1 MHz using a correlation function method. Digital up/down counters which are synchronized to the laser modulation frequency are used to compute the background-subtracted LIF signal in real time. Data streams are then cross-correlated and added to the average correlation function that is used to compute the fluctuation cross power spectrum. Our measurements show strong ion fluctuations near 500 kHz (about half the ion plasma frequency). [1] S. W. Mattingly and F. Skiff, Rev. Sci. Instrum. 89, 043508 (2018), <https://doi.org/10.1063/1.4995971>.

¹This research was supported by the Office of Fusion Energy Sciences at the U.S. Department of Energy under contract DE-AC04-94SL85000.

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Date submitted: 15 Jun 2018

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