

Abstract Submitted
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Kinetic correlations in driftwave fluctuations¹ FRED SKIFF, VIKRAM PATEL, University of Iowa, SHUNJIRO SHINOHARA, Interdisciplinary Graduate School of Engineering Sciences, Kyushu University — We report measurements of kinetic fluctuations in dissipative driftwave fluctuations in a uniformly magnetized plasma cylinder. A singly ionized CW Argon plasma produced by an inductive plasma source is probed using two independent diode-laser based laser-induced fluorescence systems operating on transitions from separate metastable states (transitions at 668nm and 1047nm). The ions are weakly collisional in the $n=10^9\text{ cm}^{-3}$, $T_e=2\text{ eV}$, $T_i=0.1\text{ eV}$ plasma with a neutral pressure of $2\times 10^{-4}\text{ Torr}$. Earlier measurements have been made using a single laser beam and were therefore limited to correlations at the same ion velocity. Here we look at the use of two laser beams, as well as the fast wavelength scanning of a single laser, to detect correlations between ions at different velocities parallel to the confining magnetic field. Tests are performed to explore correlations due to optical pumping (which are clearly observed at high laser power between the metastable magnetic sublevels). Of particular interest is the correlation width in velocity space, which pertains to the effective degrees of freedom of the plasma.

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