Abstract Submitted
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Measurement of two-point two-velocity correlation functions in the ion phase-space[1] FRED SKIFF, University of Iowa — Using two single frequency tunable lasers we generalize the technique used previously to measure two-point correlation functions to allow two different selected velocities as well. A steady-state singly-ionized Argon plasma with density 10^9 cm^{-3}, electron temperature of 2 eV, and ion temperature of 0.1 eV in a uniformly magnetized plasma cylinder is produced using a CW radio-frequency source. The plasma column is 10 cm in diameter and the main chamber is 200 cm in length. The measurements concern the low-frequency electrostatic fluctuations that occur naturally near the electron drift frequency driven by the radial electron temperature gradient. Two independent LIF systems, with detection systems on movable carriages, are scanned using computer-controlled stepper motors. One system involves a Argon-ion pumped single-frequency dye laser at 611nm with detection at 461 nm. The second system uses a single-frequency tunable diode laser at 668nm with detection at 443nm. By looking at cross-correlation between the two detection systems it is a measurement of <f(x,v,t)f(x',v',t')> is realized. We will describe the tests and validations used to rule out instrumental effects on the measurement and compare the results to previous measurements of <f(x,v,t)f(x',v,t')> made using a single laser beam.

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