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Measuring Density Fluctuations And Particle Transport On MST Using Laser Polarimetry-Interferometry[1] TRAVIS YATES, WEIXING DING, TROY CARTER, DAVID BROWER, UCLA — Simultaneous interferometry-polarimetry measurements with a bandwidth ∼500 kHz and 8 cm chord spacing have been utilized to determine the core density and magnetic field fluctuations in MST. Density fluctuations arising from magnetic fluctuations contribute to electron particle transport. An outward radial flux of particles is caused by a non-zero correlation between velocity and density fluctuations. It is also possible to measure the energy balance, proportional to $\tilde{n}^2$, of density fluctuations during a sawtooth event where the stochasticity of the magnetic field is largest. Measurements show that density fluctuations cannot be balanced by the energy coming from the gradient in the mean plasma density profile. Initial results indicate that, for core modes, density fluctuations are unstable and likely damped by nonlinear coupling, proportional to the gradient of the fluctuating plasma density. Measurements will focus on nonlinear interactions between the dominant, core-resonant modes, (m,n): (1,7)-(1,6)=(0,1). At the sawtooth, a burst of (0,1) mode activity acts to enhance the 3-wave interaction.

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