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Measurements of core density and magnetic field fluctuations on the MST[1] TRAVIS YATES, WEIXING DING, TROY CARTER, DAVID BROWER, UCLA, JOHN SARFF, STEWART PRAGER, University of Wisconsin, Madison — Fluctuations play an important role in anomalous particle, momentum and energy transport. Core magnetic and density fluctuations are measured using a high-speed, laser-based, Faraday rotation-interferometry system with a bandwidth of 500 kHz and 8 cm chord spacing. Line-averaged measurements of magnetic and density fluctuations can be inverted using a newly developed inversion method to obtain the local spatial profiles. Spatial structure for modes with m=1, n=6 up to n=16, as well as the m=0, n=1 mode are identified. Fluctuation profiles for modes of given helicity show noticeable changes during the sawtooth cycle. These measurements can also be exploited to determine the local plasma displacement ($\xi_r = \delta n/\nabla n_0$) and radial velocity fluctuations ($\tilde{v}_r = \partial \xi_r/\partial t$) associated with stochastic magnetic fields. Using these parameters, issues related to anomalous particle and momentum transport are addressed. Detailed modeling of local particle density and magnetic fluctuations will be presented.

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