Measurements of core density and magnetic field fluctuations on the MST\textsuperscript{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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