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Probe Measurements of Particle and Momentum Transport in the edge of MST M.C. MILLER, A.F. ALMAGRI, D. CRAIG, D.A. ENNIS, G. FIKSEL, S. GANGADHARA, A. KURITSYN, S.C. PRAGER, D. STONE, T.D. THARP, University of Wisconsin-Madison — Direct measurements of fluctuation-induced particle transport, Maxwell stress, and Reynolds stress have been made in the edge plasma of the MST RFP. Particle transport, $\langle \widetilde{n}\widetilde{v_r} \rangle$, Reynolds stress, $-\rho(\tilde{v} \cdot \nabla)\tilde{v}$, and Maxwell stress, $\tilde{j} \times \tilde{B}$, all depend on the correlation between fluctuating quantities. These fluctuations of have been measured in the edge of MST with probes. Whereas previous velocity measurements relied on measuring the drift velocity, $\boldsymbol{E} \times \boldsymbol{B}$, $\boldsymbol{v}$ is now measured directly. A spectroscopic probe measured v_r, and a Mach probe measured v_θ and v_ϕ. Density and magnetic field were measured with a triple tip Langmuir probe and pickup coil triplets respectively. In the edge of MST, during reconnection events, the Reynolds stress is measured to be an order of magnitude larger than the inertial term in the momentum balance equation, but it is balanced by the Maxwell stress. Particle transport increases dramatically during a reconnection event, going up several times its pre-crash value. This poster presents probe design, the details of the correlation techniques, and experimental results. Work is supported by the US DOE and the NSF.

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