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Measurements of Hall Reconnection in MST[1] T.D. THARP, A.F. ALMAGRI, M.C. MILLER, V.V. MIRNOV, S.C. PRAGER, J.S. SARFF — Previous measurements in MST have established that two-fluid Hall effects produce a dynamo EMF during magnetic relaxation events (sawteeth), and therefore two-fluid dynamics are important to the macroscopic effects of reconnection. This Hall dynamo was established by measuring the nonlinear Hall term ($\tilde{J} \times \tilde{B}$) in the axisymmetric (flux-surface-averaged) Ohm's Law. Here, we report measurements of terms in the *non*-axisymmetric Ohm's Law, including the reconnection electric field and terms that balance this field. This analysis is applied to tearing modes with poloidal mode number $m = 0$ and toroidal mode number $n \geq 1$. Measurements are performed with probes in the vicinity of the resonant surface, and clearly indicate that single fluid physics is not sufficient to explain this reconnection. In particular, nonlinear three-wave interaction Hall terms are a strong contributor to the dynamics of this reconnection and the associated island formation.

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