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Edge probe measurements of the dynamo in the MST RFP A. KURITSYN, A.F. ALMAGRI, D. CRAIG, G. FIKSEL, M. MILLER, Center for Magnetic Self-Organization, Department of Physics, University of Wisconsin-Madison — Standard discharges in the MST RFP are characterized by cyclical rapid relaxation events (sawtooth oscillations), when the RFP dynamo is generated. Previous work [P. Fontana et al., PRL, **85**, 566 (2000)] indicated that the MHD dynamo $< \tilde{\mathbf{v}} \times \tilde{\mathbf{b}} >$ is operating at the plasma edge, but is substantially reduced at the reversal surface. Present dynamo measurements with a newly developed insertable optical probe (which has improved design and resolution) and magnetic probes are aimed to understand the cause of this reduction. It is observed that $\tilde{b}_t$ changes phase by π near reversal surface, while phases of all the other fluctuating quantities remain unchanged. Thus, $< \tilde{v}_r \tilde{b}_t >$ component of MHD dynamo changes sign and cancels $< \tilde{v}_t \tilde{b}_r >$. The Hall dynamo $< \tilde{\mathbf{j}} \times \tilde{\mathbf{b}} >$ is believed to be important for balancing the parallel component of the generalized Ohms law near the reversal surface. A new probe, which combines 3 orthogonal Rogowski coils and 3 magnetic coils, is presently under construction and will be employed to study this effect. We are also developing a Mach probe with embedded magnetic coils, which will be used to measure other components of the MHD dynamo. This set of tools, combined with other MST diagnostics, will allow study of the relative importance of different terms in the generalized Ohm's law across the plasma minor radius. MST is jointly supported by US DOE and NSF.

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