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Effects of Resistivity and Viscosity on m=0 Rise and Fall Time in the RFP A.M. FUTCH, D. CRAIG, R. HESSE, Wheaton College, Wheaton, IL USA, C.M. JACOBSON, University of Wisconsin - Madison, WI USA — In the reversed field pinch (RFP), poloidal mode number m=0 fluctuations are driven in a sawtooth cycle via nonlinear coupling with unstable m=1 tearing modes. We explore how the rise and fall time of these m=0 fluctuations depends on resistivity and viscosity in visco-resistive MHD simulations using the DEBS code. Both the Lundquist number (S) and magnetic Prandtl number (Pr) affect the rise/fall time. Analysis of MST experimental data also shows that both the rise and fall times of the m=0 amplitude vary with S. The variation observed in experiment is consistent with simulation results for rise time, but shows some differences for fall time. Rise time is insensitive to the resistivity profile but depends slightly on the viscosity profile. Fall time is strongly correlated with the duration of the crash which depends on both resistivity and viscosity profiles. These results suggest that the rise and fall time of the m=0 modes at the sawtooth crash is not strongly influenced by the local resistivity near the resonant surface but instead is primarily determined by the overall dynamics of the entire sawtooth cycle. The role of viscosity is less clear though the edge viscosity affects the m=0 evolution more than the core. This work has been supported by the U.S.D.O.E.

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