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Computational Studies of Dynamo Suppression in the Reversed Field Pinch During PPCD JIM REYNOLDS, CARL SOVINEC, University of Wisconsin-Madison — Laboratory experiments with Pulsed Poloidal Current Drive (PPCD) have shown reduction of the magnetic fluctuations that introduce stochasticity to magnetic field trajectories and lead to anomalous energy transport in the RFP[1,2]. We apply the NIMROD nonlinear MHD code[3] to study the interaction between the mean field evolution and the tearing fluctuations during PPCD. Post processing diagnostics show reduced power transfer from the dynamo fluctuations and the nonlinear growth rates of several modes sustained by nonlinear coupling decline. The linear growth rate calculations of dominant core resonant modes show similar trends to nonlinear results , justifying detailed linear analysis. We track the evolution of terms in Ohm's Law to assess the key features of the PPCD electric field transient that modify the parallel current. We use a linear stability analysis code to reveal how PPCD affects the source of free energy to the core modes. Eigenfunction calculations show early stabilization due to penetrating applied electric fields that reshape the parallel current profile near the mode resonance. [1] Anderson, et al. Phys. Plasmas. 11, L9 (2004). [2] Fiksel, et al. Phys. Rev. Letters. 72 (7) (1994). [3] Sovinec, et al. Phys. Plasmas. 10 (2003).

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