

Abstract Submitted
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Active Feedback Control of Interchange Turbulence in a Laboratory Magnetosphere¹ T.M. ROBERTS, M.E. MAUEL, M.W. WORSTELL, Columbia University — The CTX device is a laboratory magnetosphere where low density plasmas are interchange unstable, allowing turbulent plasma dynamics to develop. Previous work has investigated the nature of this turbulence and observed the effects of applied static electric fields. Here we present first work on actively suppressing these turbulent fluctuations through electrostatic feedback control. A new feedback system has been designed and fabricated which allows us to measure potential fluctuations and apply a variably phase shifted response. Phase scan experiments and scans of location the of the sensor/actuator pair in have been performed and the results are presented. Phase dependent changes to the power spectrum are observed via Langmuir probes and gridded energy analyzers. We also present plans for future feedback methods implementing digital signal processing.

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