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Exciting quasi-coherent interchange modes in a dipole-confined plasma[1] M.W. WORSTELL, M.E. MAUEL, T.M. ROBERTS, Columbia University — Research in the Collisionless Terella Experiment (CTX) studies intense, nonlinear interchange dynamics of magnetized plasma confined by a dipole magnetic field. When operating at lower densities fast-electon interchange instabilities appear in quasiperiodic coherent bursts.[2] When the neutral pressure is increased, the interchange instabilities transition to a turbulent state consisting of chaotic time- varying modes with broad global mode structures.[3] Transient bursts of radial transport are a consequence of the random dynamics of the large scale convective structures. In this presentation, we describe experiments that modify the spectrum, coherence, and intensity of the interchange fluctuations through the application of electrostatic bias that drives plasma convection. In particular, when static bias is applied to a turbulent plasma in the high-density regime, a quasi- coherent mode appears, which alters the turbulent spectrum. The turbulent spectra and the characteristics of the quasicoherent mode vary as the strength and azimuthal structure of the driven convection change.

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[2]B. Levitt, D. Maslovsky, and M.E. Mauel, *Phys. Plasmas* **9** 2507 (2002)
[3]B.A. Grierson, M.W. Worstell, M.E. Mauel, *Phys. Plasmas* **16** 055902 (2009)

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