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Fluctuations and Turbulence in the Enormous Toroidal Plasma Device at UCLA[1] ROBERT NIEDERRITER, Lawrence University, CHRIS COOPER, TROY CARTER, PAVEL POPOVICH, UCLA — Turbulence and transport across magnetic field lines disrupt plasma confinement, which is particularly troublesome in toroidal geometries potentially useful for fusion energy. We investigate fluctuations of a helium plasma in the Enormous Toroidal Plasma Device (ETPD) at UCLA using 4-tip Langmuir probes to measure potential and ion saturation current. ETPD is a simple magnetized torus with major radius 5 m. The toroidal vacuum chamber has a rectangular cross section that is 3 m tall and 2 m wide. Plasma is generated by a lanthanum hexaboride (LaB6) cathode discharge into a helical magnetic field produced by a $\sim$ 200 G toroidal field and a $\sim$ 6 G vertical field. Typical plasma density is $n_e \sim 10^{13}$ cm^{-3} and typical electron temperature is $T_e \sim 10 - 20$ eV. Observed fluctuations are characterized and compared with theories of drift waves and interchange modes.

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