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**Intermittency in the Helimak, a simple magnetic torus**[1] E.I. TAYLOR, W.L. ROWAN, K.W. GENTLE, W. HORTON, T. BERNARD, IFS, UT Austin — Irregularly-spaced, large-amplitude bursts are observed in the Helimak plasma turbulence with sufficient definition to investigate their physical basis and possibly improve understanding of the induced particle transport. The Helimak is an experimental realization of a sheared cylindrical slab that generates and heats a plasma with microwaves and confines it in a helical magnetic field. Although it is MHD stable, the plasma is always in a nonlinearly saturated state of microturbulence. The intermittency in this turbulence manifests itself in highly skewed PDFs of the normalized electron density. Cross-conditional averaging exposes large amplitude structures propagating down the density gradient at a few hundred meters per second. Introduction of a radial electric field via bias plates appears to suppress these intermittent transport events (ITEs) for Er pointing down the density gradient. In addition, the cross-conditionally averaged waveforms are relatively unchanged as connection length is varied. Within certain regimes, our measurements are consistent with the predictions of a stochastic model that represents the plasma fluctuations as a random sequence of burst events. Furthermore, we attempt to gain insight into the physical origin of these ITEs by searching for similar statistical behavior in fluid and gyrokinetic simulations.

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Edward Taylor
IFS, UT Austin

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