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Characterization of Instabilities in a Simple Magnetized Torus C.B. WILLIAMS, K.W. GENTLE, University of Texas at Austin — The Texas Helimak is an approximation to the cylindrical slab with large physical size compared to the correlation lengths of its instabilities and an open magnetic field line configuration. As such, it functions effectively as a test-bed for the physics of the SOL at low densities and temperatures. This allows for the use of Langmuir probe diagnostics. Much of the research performed on the device has focused on its high turbulent amplitudes. It was initially believed, both experimentally and theoretically, that the turbulence is dominated by a fluid drift wave. However, more recent evidence suggests that the identification of the Helimak instabilities is not so straightforward, but may vary with the connection length of the magnetic field lines through both drift wave and interchange instability regimes. In this work we document efforts to characterize the turbulence based on measurements of both parallel and perpendicular wavenumbers and other Langmuir probe data. We use a variety of statistical methods to differentiate instabilities. We also conduct an analysis of possible blobs in the plasma. Finally, we apply a radial electric field to the plasma to determine its effect on the wavenumbers of the instabilities.

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