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Experimental Investigation of Turbulence and Transport in the Helimak Configuration K. LEE, D. MIRACLE, J. FELKL, K. GENTLE, Fusion Research Center, U. of Texas at Austin, Austin TX 78712 — Density fluctuations and transport in the Helimak device are investigated as a function of the connection length, L_c, and gas species. Radial equilibrium profiles for Ar and He show structure where n and T_e peak outside the electron cyclotron resonance radius. Due to the fact that the magnetic field on the LFS has unfavorable curvature, density fluctuation levels on this side are increased. For short L_c results are consistent with the idea that these fluctuations are unstable drift waves. As L_c increases, the LFS gradient becomes steeper and the fluctuation levels increase to more than 50%. Probability distribution functions in this region display highly non-Gaussian structure, and raw data suggests plasma here exhibits intermittency. In He plasmas a quasi-periodic oscillation occurs at longer L_c which appears to consist of two or more low frequency components, $f_k < 1$ kHz. Both radial and parallel transport are investigated with results indicating that at longer L_c the particle fluxes are dominated by transport perpendicular to the magnetic field. Work supported by US Department of Energy grant DE-FG03-00ER54609

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