

Abstract Submitted
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Investigations of Particle Transport in the Texas Helimak.¹ E.I. TAYLOR, W.L. ROWAN, K.W. GENTLE, H. HUANG, C.B. WILLIAMS, Institute for Fusion Studies, The University of Texas at Austin — The correlation between electrostatic turbulence and particle flux is investigated in a simple magnetic torus, the Helimak. The Helimak is an experimental realization of a sheared cylindrical slab that generates and heats a plasma with microwaves at 2.45 GHz 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 causes of this turbulence are diverse and it is thought that it is either due to drift wave instabilities or interchange instabilities. The local particle flux is estimated over most of the plasma cross section by measuring the particle source using filtered cameras. Plasma flow along the field lines is physically similar to SOL flows in tokamaks. It is significant and can be measured directly as well as inferred from asymmetries in the electron density. The cross field transport due to electrostatic turbulence is measured as the cross correlation of radial electric field fluctuations with electron density fluctuations with the data acquired using Langmuir probes.

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