

Abstract Submitted
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Instabilities in the Helimak Experiment¹ D. MIRACLE, K. LEE, J. FELKL, K. GENTLE, FRC, U. of Texas, Austin, J. WILEY, IFS, U. of Texas, Austin — The Helimak offers a simple configuration for exploring plasma instabilities in the SOL that can be checked against simulation. Here we experimentally study the onset of instabilities that are predicted by the blob equations². We study the turbulence in the Helimak configuration for various connection lengths in Helium and Argon plasmas. For long connection lengths ($\sim 100\text{m}$) the spectrum is broad, peaking at low frequencies. For short connection lengths ($\sim 20\text{m}$), a second higher frequency peak appears that scales with ion mass. We have found that in this regime our plasma displays statistical similarity to simulations of the blob equations. In addition we examine the 2D structure of the turbulence and compare with the structures from the simulation. We characterize the radial transport and isolate the fundamental instabilities that give rise to turbulence in the Helimak.

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²D. A. D'Ippolito, et al., Phys. Plasmas **9** 222- 233 (2002)

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