Abstract Submitted
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Gyrokinetic continuum simulations of turbulence in the Texas Helimak[1] T.N. BERNARD, Univ of Texas, Austin, E.L. SHI, Princeton University, G.W. HAMMETT, A. HAKIM, Princeton Plasma Physics Laboratory, E.I. TAYLOR, Univ of Texas, Austin — We have used the Gkeyll code to perform $3x$-$2v$ full-f gyrokinetic continuum simulations of electrostatic plasma turbulence in the Texas Helimak. The Helimak is an open field-line experiment with magnetic curvature and shear. It is useful for validating numerical codes due to its extensive diagnostics and simple, helical geometry, which is similar to the scrape-off layer region of tokamaks. Interchange and drift-wave modes are the main turbulence mechanisms in the device, and potential biasing is applied to study the effect of velocity shear on turbulence reduction. With Gkeyll, we varied field-line pitch angle and simulated biased and unbiased cases to study different turbulent regimes and turbulence reduction. These are the first kinetic simulations of the Helimak and resulting plasma profiles agree fairly well with experimental data. This research demonstrates Gkeyll's progress towards 5D simulations of the SOL region of fusion devices.

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