

# Continuum Gyrokinetic Simulations of NSTX SOL Turbulence with Sheath-Limited Model Geometries

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We describe results obtained from Gkeyll, a full-F continuum gyrokinetic code, designed to study turbulence in the edge region of fusion devices. The edge region is computationally very challenging, requiring robust algorithms that can handle large amplitude fluctuations and stable interactions with sheath boundary conditions. Results of turbulence in a scrape-off layer (SOL) for NSTX-type parameters with a model magnetic geometry have been obtained. Key physics of SOL turbulence, such as drive by toroidal bad curvature and steep gradients and interactions with a model sheath boundary condition are included. This allows us to perform parameter scans and physics studies, such as the physics of heat flux width on the divertor plate, and the amplitude and intermittency of SOL turbulence. Initial results find that the heat flux narrows as the connection length is made shorter (the poloidal field becomes stronger). We have begun studies on the effect of recycling on the edge, to better understand low-recycling lithium cases. To validate the code, we have studied turbulence in the straight-field LAPD device at UCLA and the helical Helimak device at the University of Texas. We will also describe the extension of the GENE gyrokinetic code to be full-F, and initial GENE simulations for LAPD.

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