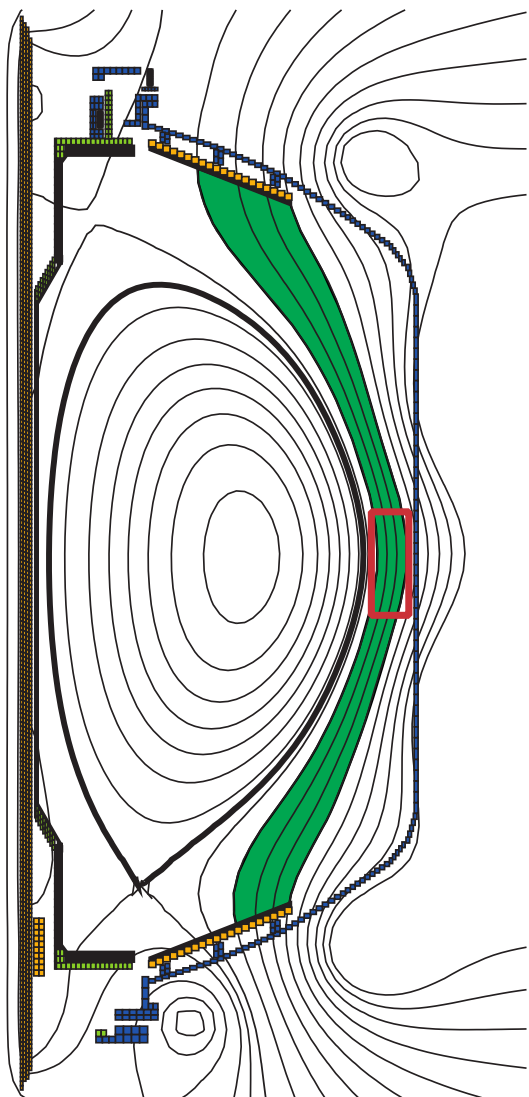
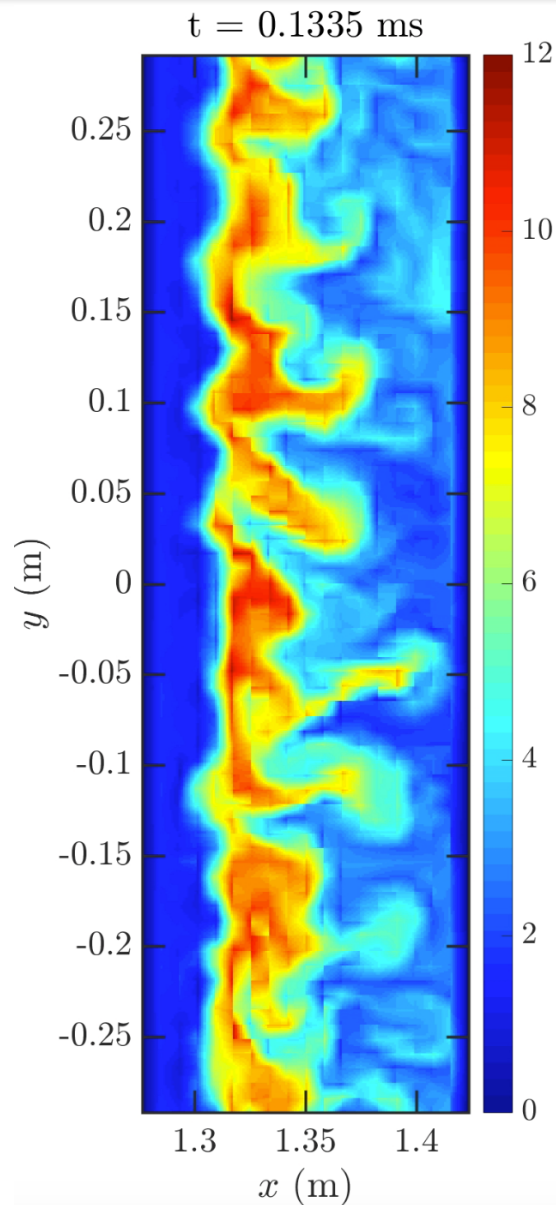


# Gkeyll: First Continuum 5D Gyrokinetic Simulations of Turbulence in SOL with sheath model boundary conditions



Edge region has been computationally very difficult.



Various simplifications at present, such as helical model of SOL (toroidal + vertical B field).  
XGC is only gyrokinetic turbulence code that can handle separatrix at present.

E. Shi Ph.D. 2017 LAPD: E. Shi, A. Hakim, T. Stolfus-Dueck, J. Plasma Physics (2017)

# Plans for MAST-U

- Even though Gkeyll does not yet have complete physics for tokamaks (X-point geometry, detailed atomic physics, magnetic fluctuations), it is timely to begin comparison with experiments.
- We have started to add simplified atomic physics, radiation loss, magnetic shear and recycling physics to potentially allow GK study of Super-X configuration
- Plan: Tess Bernard (U. Texas grad student) will work with G. Hammett and A. Hakim on setting up MAST SOL parameters in Gkeyll.
- Work will be in collaboration with Mike Kotschenreuther and Swadesh Mahajan of U. Texas at Austin.
- Time frame: Project start ~ Jan 2018. (Tess Bernard will be funded off David Hatch's GK SciDAC. PPPL PI: G. Hammett. Currently finishing up paper on Gkeyll study of Helimak).