

# Particle-in-cell delta-f gyrokinetic simulations of the microtearing mode in the edge and core of NSTX

*J. Chowdhury, Yang Chen, Weigang Wan, Scott E. Parker,  
Department of Physics, University of Colorado, Boulder, CO 80309, USA  
W. Guttenfelder,  
Princeton Plasma Physics Laboratory, Princeton, NJ 08540, USA  
J. M. Canik,  
Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA*

The study of the microtearing mode in NSTX using the electromagnetic gyrokinetic PIC code GEM [1] will be presented [2]. We study the microtearing mode for a set of parameters that corresponds to the edge where microtearing mode was observed to be unstable at the pedestal top without lithium coating of plasma facing components [3]. We study the dependence of the microtearing mode on various equilibrium quantities in the edge region. Starting from an introduction to the electromagnetic GEM we will discuss the linear and nonlinear properties of the mode. The properties of the microtearing mode in the edge will then be compared with those of the mode in the core [4].

- [1] Y. Chen and S. E. Parker, *Journal of Comp. Phys.* 189, 463(2003) and 220, 839(2007)
- [2] J. Chowdhury, *et al.* *Phys. Plasmas* 23 012513 (2016)
- [3] J.M. Canik *et al.*, *Nucl. Fusion* 53, 113016 (2013)
- [4] W. Guttenfelder *et al.*, *Phys. Plasmas* 19, 022506 (2012)

## **Poster**