Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Secondary Instabilities in 3-D Magnetic Reconnection under a Strong Guide Field XUEYI WANG, YU LIN, Auburn University, LIU CHEN, University of California, Irvine — 3-D magnetic reconnection is investigated using the gyrokinetic electron and fully-kinetic ion (GeFi) particle simulation model. The simulation is carried out for a force free current sheet with a strong guide field B_G as occurring in solar and laboratory plasmas. It is found that secondary instabilities are excited in the separatrix region of the primary reconnection due to the 3-D effects associated with the finite k_z, where k_z is the wave number along the guide field direction. The instabilities are demonstrated as being of the MHD kink type, which lead to electron heating and acceleration in the parallel direction. The dependence of the growth rate of the secondary instabilities on the electron-ion resistivity, the ion-to-electron mass ratio m_i/m_e, and the half-width of the current sheet are also investigated.

Xueyi Wang
Auburn University

Date submitted: 13 Jul 2017 Electronic form version 1.4