Geophysical Research Abstracts
Vol. 14, EGU2012-8382, 2012
EGU General Assembly 2012

Kinetic structure of collisionless reconnection: hybrid simulations

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Magnetic reconnection is a fundamental process observed in various space plasma systems, such as, for example, interface between planetary magnetosphere and solar wind at the dayside magnetopause. We study magnetic reconnection by means of two-dimensional hybrid approach (kinetic ions and fluid electrons). Our initial configuration consists of Harris equilibrium layer with small amplitude perturbation of magnetic field. These perturbations are origins of the formation of magnetic islands. In this study we focus on the role of ionic kinetic effects during the reconnection process, we examine the temperature anisotropy and gyrotropy of the ion velocity distribution functions. We discuss the importance of these kinetic effects by comparing the results from hybrid simulations with the results from magneto-hydrodynamic (MHD) simulations results.