Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Energetics of kinetic reconnection in a three-dimensional null point cluster VYACHESLAV OLSHEVSKY, GIOVANNI LAPENTA, KU Leuven, STEFANO MARKIDIS, KTH Royal Institute of Technology — We performed three-dimensional Particle-in-Cell simulations of magnetic reconnection with multiple magnetic null points. Magnetic field energy conversion into kinetic energy was about five times higher than in traditional Harris sheet configuration. More than 85% of initial magnetic field energy was transferred to particle energy during 25 reversed ion cyclofrequencies. Magnetic reconnection in the cluster of null points evolved in three phases. During the first phase, ion beams were excited, that then gave part of their energy back to magnetic field in the second phase. In the third phase, magnetic reconnection occurs in many small patches around the current channels formed along the stripes of low magnetic field. Magnetic reconnection in null points presents essentially three-dimensional features, with no two dimensional symmetries or current sheets. Results presented here are accepted to PRL http://prl.aps.org/accepted/6c076Yf6O321ba35e6e99ba2f0b0c80089a85f17d

Giovanni Lapenta
KU Leuven

Date submitted: 05 Jul 2013 Electronic form version 1.4