Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Numerical Simulations of Turbulent MHD Reconnection[1] NUNO LOUREIRO, UKAEA/EURATOM Fusion Association, DMITRI UZDENSKY, Princeton University/CMSO, ALEXANDER SCHEKOCHIHIN, Imperial College London, TAREK YOUSEF, Cambridge University and Imperial College London — Magnetic reconnection is a very important process in a large number of laboratory, space, and astrophysical plasmas. It is usually believed that in the resistive MHD regime, the reconnection rate obeys the classical Sweet-Parker scaling, proportional to the square root of the resistivity, and is thus very slow. Whether reconnection can be significantly accelerated in the presence of MHD turbulence[2] is still an unresolved question. In this study, we use high-resolution incompressible resistive magnetohydrodynamic numerical simulations to investigate the effect of externally imposed small-scale turbulence on the reconnection of a large-scale magnetic field. We characterize the turbulent enhancement of the reconnection rate over the laminar Sweet-Parker rate as a function of the resistivity, turbulent driving scale and amplitude.

[1]work supported by NSF CMSO.
[2]A. Lazarian & E. Vishniac, ApJ, 517, 700 (1999).

Dmitri Uzdensky
Princeton University/CMSO

Date submitted: 18 Jul 2008 Electronic form version 1.4