Geophysical Research Abstracts
Vol. 12, EGU2010-6704, 2010
EGU General Assembly 2010

In-situ observations of magnetic reconnection in turbulent plasma

Alessandro Retinò (1), David Sundkvist (2), Andris Vaivads (3), Forrest S. Mozer (2), Rumi Nakamura (1), Fouad Saharoui (4), and Stuart D. Bale (2)

(1) Austrian Academy of Sciences, Space Research Institute, Graz, Austria (alessandro.retino@oeaw.ac.at, +43 316 4120590), (2) Space Sciences Laboratory, University of California, Berkeley, USA, (3) Swedish Institute of Space Physics, Uppsala, Sweden, (4) LPP/CNRS-Ecole Polytechnique, Paris, France

The relationship between magnetic reconnection and turbulence is a fundamental problem of plasma physics. Reconnection and turbulence are ubiquitous in magnetized plasma ranging from laboratory to distant astrophysical plasma. Despite of its importance, the relationship between reconnection and turbulence is yet poorly understood. The near-Earth space is an excellent laboratory to study turbulent reconnection through multi-point high-resolution in-situ measurements of particle distribution functions and electromagnetic fields in turbulent regions. Here we present the first direct evidence of reconnection in turbulent plasma by using Cluster four-spacecraft observations in the magnetosheath downstream of the quasi-parallel terrestrial bow-shock. We discuss the implications of turbulent reconnection for the dissipation of electromagnetic energy and for particle acceleration.