



Effects of turbulent reconnection on the evolution of dipolarisation fronts in the Earth magnetotail.

Giovanni Lapenta and Lapo Bettarini

Katholieke Universiteit Leuven, Afdeling Plasma-astrofysica, Heverlee, Belgium (giovanni.lapenta@wis.kuleuven.be, +32-(0)16-327998)

Reconnection in the Earth magnetotail leads to the formation of two fronts of predominantly vertically directed field lines propagating away from the region of reconnection, Earthward and tailward. We analyse the formation of such fronts and in particular investigate the consequences of assuming a turbulent reconnection process. In our 3D MHD simulations reconnection transitions spontaneously to a turbulent regime due to the destabilisation of the SP layer by the secondary tearing and the formation of plasmoids [1,2,3]. In 3D simulations this leads to a disturbance of the dipolarisation fronts, the topic of the present work. We investigate the chain of instabilities driven by the turbulent reconnection process, arriving at theoretical predictions of the scales of the disturbances of the dipolarisation front in good agreement with observational evidence [4].

- [1] G. Lapenta, Phys. Rev. Lett., 100, 235001, 2008
- [2] M. Skender, G. Lapenta, Phys. Plasmas, 17, 022905, 2010.
- [3] L. Bettarini, G. Lapenta, Astronomy Astrophys., 13652, DOI: 10.1051/0004-6361/200913652, 2010.
- [4] P.N. Guzdar, A. B. Hassam, M. Swisdak, and M. I. Sitnov, Geophys. Res. Lett., 37, L20,102, 2010.