



Magnetospheric MultiScale observations of energetic ion acceleration at multiple turbulent jet fronts

Alessandro Retinò and the MMS Team

LPP CNRS, Paris, France (alessandro.retino@lpp.polytechnique.fr)

Plasma jets in astrophysical plasma frequently lead to the formation of kinetic-scale boundaries, often referred to as jet fronts, which separate the hot jetting from the colder ambient plasma ahead of the jet. In the Earth's magnetotail, jets fronts are often associated with reconnection and are observed by spacecraft as a steep increase in the component of the magnetic field normal to the current sheet, accompanied by a plasma temperature increase and density decrease. Jet fronts play an important role in ion acceleration in the magnetotail. However, how exactly the different ion species get accelerated is still unclear. Recent high-resolution measurements of ion distribution functions in the magnetotail from the Magnetospheric MultiScale (MMS) spacecraft allow now for the first time to study the acceleration mechanisms in detail and their dependence on the ion species. Here present an event with multiple turbulent jet fronts observed by MMS in the magnetotail. Such fronts have also been recently reproduced by Particle-In-Cell numerical simulations. We investigate the acceleration of protons and heavier ions due to the interaction of fronts and the role of jets' turbulence for the energization.