



Cluster observations of guide field magnetopause reconnection at sub-ion/electron scales.

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Magnetic reconnection at the magnetopause has been extensively studied in the last few decades by using observations from many spacecraft. Nevertheless the microphysics of reconnection, i.e. the physics at ion scales and below, is not yet fully understood. Most of the knowledge comes from numerical simulations however in situ observations are required to test the simulation predictions. In particular the knowledge of the electron-scale physics is very poor, due to the scarcity of measurements at those scales. Studying the electron scales is crucial to understand how reconnection starts (onset) and how electrons are heated/accelerated. Here we present novel Cluster observations at the subsolar magnetopause, where two spacecraft are separated by ~ 20 km while being apart ~ 10000 km from the others corresponding to sub-ion and MHD scales respectively. The observation of a jet reversal between the spacecraft at large separation indicate proximity to the reconnection site. Observations at sub-ion scales allow identifying a very thin rotational discontinuity (~ 10 km) with a substantial guide field that is associated with strong parallel electron heating. We interpret the observations as a possible crossing of the electron diffusion region. We discuss the relevance of Cluster electron-scale measurements of reconnection as preparation for the upcoming NASA/MMS mission.