

## **Particle acceleration near magnetic nulls using MMS data**

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Regions with vanishing magnetic field, also referred to as magnetic nulls, are of high interest in plasma physics. Near magnetic nulls particles become unmagnetized and can by interacting with electric fields be accelerated up to high energies. Magnetic nulls have been observed and studied before using Cluster data with different methods. Magnetic nulls found by Cluster have been obtained with spacecraft separation comparable to ion scales and particle instrumentation is not sufficient to resolve in detail physical processes of particle acceleration around the null. Now we use the MMS (Magnetospheric Multiscale) data to study these processes in detail. The MMS separation is well below the ion scale and data from particle instruments has sufficient resolution during burst mode to resolve these processes for our events.

We study nulls in detail during phase 1a of the MMS mission. Burst data during this phase are mainly from the magnetopause, but some intervals cover the magnetosheath, bowshock, and solar wind. We particularly focus on magnetic nulls associated with strong currents, which can potentially be associated with the electron diffusion region of magnetic reconnection. There we also expect particle acceleration to occur. A preliminary study has already identified several nulls of high interest in the burst data. We present a detailed study of these nulls.