Capturing the active reformation of a supercritical shock with MMS

Hadi Madanian*[1]

[1]PHaSER – United States

Abstract

In this study, we use data from the Magnetospheric Multiscale (MMS) mission obtained during the recent string-of-pearls campaign to study the properties of a reforming quasi-parallel shock. Observations are made during a bow shock crossing event when the upstream solar wind Alfvenic Mach number is _˜7, and plasma beta _˜ 0.6.The preliminary analysis indicates that fluxes of backstreaming ions results in formation of localized foreshock perturbations upstream of the bow shock. The solar wind plasma between the foreshock perturbations and the main bow shock transforms into a heated and shocked plasma, initiating a cycle of shock reformation. This jump in the position of the shock occurs despite upstream plasma structures continuously being blown towards theshock. These observations help to fill the gap in our knowledge around shock reformation processes.

*Speaker