Geophysical Research Abstracts
Vol. 17, EGU2015-2017, 2015
EGU General Assembly 2015

THEMIS multi-spacecraft observations of magnetosheath high-speed jets: Scale sizes and other characteristics

Ferdinand Plaschke (1), Heli Hietala (2), Vassilis Angelopoulos (3), and Rumi Nakamura (1)

(1) Space Research Institute, Austrian Academy of Sciences, Graz, Austria (ferdinand.plaschke@oeaw.ac.at), (2) Blackett Laboratory, Imperial College, London, UK, (3) Department of Earth, Planetary, and Space Sciences, University of California Los Angeles, CA, USA

Under quasi-radial interplanetary magnetic field conditions, the dayside magnetosheath is permeated by localized enhancements of dynamic pressure (high speed jets). When impinging on the magnetopause, these jets cause boundary distortions and excite magnetopause and magnetospheric waves. Multi-spacecraft observations of high speed jets by the THEMIS spacecraft allow us to infer jet flow-parallel and flow-perpendicular scale sizes. We find the scale size distributions to be well-modeled by exponential functions with characteristic diameters of 0.72 (parallel) and 1.34 Earth radii (perpendicular scale sizes). The median flow-parallel scale sizes increase with distance from the bow shock. We are able to link large/small size jets to specific solar wind conditions and jet characteristics. Furthermore, we present flow patterns inside and outside of jets that exhibit vortical plasma motion as a result of jet propagation through the slower-moving magnetosheath plasma.