2025 Workshop: KiTS-COMP

Long title
KiTS-COMP joint session on thin current sheets throughout the solar system
GEM-only session
Conveners
Harry Arnold
Anton Artemyev
Jason Derr
Akhtar Ardakani
George Clark
Wen Li
Bob Marshall
Dan Gershman
Peter Delamere
Shannon Curry
harry.arnold@jhuapl.edu
Description

Kinetic scale thin current sheets are a common structure throughout the solar system. At Earth, they are often seen in the growth phase of substorms in the magnetotail. These current sheets exist on an ion scale and stretch the magnetic field. Similar thin current sheets have also been seen in cislunar space and the solar wind as well, with scales even approaching the electron gyroradius. The stability and formation of these current sheets are not well understood, but are an important part of the energy exchange in plasmas in all planetary magnetospheres and the solar wind. In this joint session, we hope to bring together researchers from both the KiTS and COMP focus groups to share their expertise on this topic. Linking dynamics between planetary magnetospheres can shed light on the formation and stability of thin current sheets by identifying the similarities and dynamics of thin current sheets in different environments. We plan to give presentations ~10 minutes each (including questions) to explore these thin current sheets throughout the solar system.

Agenda

All times are approximate:

(01:30 PM - 01:40 PM): Jake Montgomery - Jupiter’s current sheet

(01:40 PM - 01:50 PM): Nii-Boi Quartey - MHD Rotational Effects on Mars' Magnetotail Current Sheet

(01:50 PM - 02:00 PM): Xinmin Li - Spectral Features of Magnetic Fluctuations from Inertial to Kinetic Scales in Mercury’s Magnetotail Current Sheet

(02:00 PM - 02:10 PM): David Tonoian - Parametric Regimes of Thin Current Sheets in Planetary Magnetospheres and Solar Wind

(02:10 PM - 02:20 PM): Sergey Kamaletdinov - Kinetics of magnetotail current sheets: role of pressure agyrotropy

(02:20 PM - 02:30 PM): Harry Arnold - Thin Current Sheets in MHD Simulations

(02:30 PM - 02:40 PM): Andrei Runov - Relativistic electrons in the lunar-distant PS - may be link to COMP

(02:40 PM - 02:50 PM): Anton Artemyev - Aurora arcs and thin current sheets

(02:50 PM - 03:30 PM): Discussion

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Justification

The existence of thin current sheets and their role in plasma processes in different planetary magnetospheres is an active topic in both the KiTS and COMP focus groups and will make a compelling joint session. It is relevant to the “Kinetic Plasma Processes in the Magnetotail during Substorm Dynamics” focus group, as thin current sheets play an important role in the growth phase of substorms in the magnetotail. It is also highly relevant to the Comparative Planetary Magnetospheric Processes focus group, as thin current sheets exist in many different planetary magnetospheres.

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COMP George Clark

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