



Contribution ID: 68

Type: **Invited talk**

Suprathermal Ion Observations Associated with the Heliospheric Current Sheet Crossings by Parker Solar Probe

Wednesday, January 22, 2025 2:25 PM (20 minutes)

We report observations of <500 keV/nucleon suprathermal (ST) H, He, O, and Fe ions in association with several crossings of the heliospheric current sheet that occurred near perihelia during PSP encounters 7-18. In particular, we compare and contrast the ST ion time-intensity profiles, velocity dispersion, pitch-angle distributions, spectral forms, and maximum energies during the three HCS crossings. We find that these unique ST observations are remarkably different in each case, with those during E07 posing the most serious challenges for existing models of ST ion production in the inner heliosphere. In contrast, the ISOIS observations during the remaining HCS crossings appear to be consistent with a scenario in which ST ions escape out of the reconnection exhausts into the separatrix layers after getting accelerated up to ~ 50 -100 keV/nucleon by HCS-associated magnetic reconnection-driven processes. We discuss these new observations in terms of local versus remote acceleration sources as well as in terms of expectations of existing ST ion production and propagation, including reconnection-driven and diffusive acceleration in the inner heliosphere.

Contribution Type

Theme

Energetic Phenomena

Primary author: DESAI, Mihir (Southwest Research Institute)

Presenter: DESAI, Mihir (Southwest Research Institute)

Session Classification: Shocks and particle Acceleration and Transport in IP Medium