Berhe Tewelde
Teklhaimanot
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Poster
Magnetic reconnection stands as a fundamental occurrence in space and laboratory plasmas in which magnetic energy is converted into kinetic energy, released in the form of accelerated particles, flows, and heating. Although the process itself is highly localized, it eventually leads to a global change in the magnetic field topology. In this paper, we present the investigation of solar wind reconnection exhausts with an anti-sunward orientation by employing in-situ measurements from multiple spacecraft. Through a statistical analysis of reconnection exhausts, we ascertain their average properties and reveal that the plasma density and temperature of the reconnection exhaust are influenced by the plasma beta and reconnection guide field. By comparing measurements across multiple spacecraft for different distinct events, we observe changes in the structure of the reconnection current sheet with increasing distance downstream from the reconnection site. Furthermore, variations in measurements of solar wind exhausts between different events are notable, and we attribute much of this variability to differing inflow region conditions and the magnetic shear across the current sheet. In this talk, I will review this narrative in detail and point to the detection and analysis of halo electrons, considered distinctive markers of magnetic reconnection events, the energy spectra and distributions of the tilt angles of these particles, and the importance of simultaneous IMF analysis to gain insights into its role in characterizing the solar wind.

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