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Oral
(Invited Talk)
Anywhere we observe in the heliosphere, plasma is in perpetual motion and couples with magnetic flux throughout the solar system, thus raising fundamental questions about the Sun-Earth interactions whose answers we seek through tracking plasma flows. While the motion of radiating density structures in the solar wind may be easy to visualize in time series of images, they remain challenging to measure precisely and systematically. Despite the myriad of flow tracking algorithms that were implemented from Computer Vision paradigms since the 1980s, the nature of the solar wind has made it extremely difficult to map the plasma flows in coronal imagery: fuzzy boundaries of the density structures, uncertainties on their 3D locations and distributions along the line of sight, lack of “ground-truth” datasets to evaluate tracking performance, etc… Our new multidisciplinary flow tracking effort will take advantage of PUNCH’s polarized imagery and its advanced image processing pipeline: using a combination of flow tracking algorithms with advanced simulations creating realistic projections of the outflowing density structures, we will be able to evaluate our tracking accuracy and thus measure flows with quantified uncertainties. In this talk we will review this new methodology that aims to address the dearth of solar wind flow maps.
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