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Oral
(Contributed Talk)
WISPR's wide field of view shows many outflowing plasma streams that PSP's in-situ instruments will not have the chance to sample. This offers the possibility of broadening the population of wind speeds that can be measured, including at latitudes outside PSP's orbital plane. The possibility of a catalog of measured speeds close to the Sun at a range of latitudes offers a valuable comparison point for PUNCH. However, PSP's rapid motion and close proximity to the plasma being observed renders traditional flow-tracking techniques difficult or impossible to use, as the plasma's apparent motion through the image plane is only partially driven by its inherent motion. We have developed a new method of wind speed measurement using the "stationary point". When, during a short window of time, a plasma parcel is on course to "collide" with or fly directly above/below PSP (until the time window passes and the velocities change), the plasma parcel appears at a fixed direction relative to PSP, because in PSP's rest frame, the parcel is directly approaching it. By finding these apparently-stationary parcels and measuring their approach angle, their observed angle above/below the orbital plane, and the time derivative of that angle, we can infer a complete solution for that parcel's position and velocity vector. We demonstrate this method on a "stationary" parcel seen in Encounter 16, measuring the parcel to have a speed of ~260 km/s while it is 6 R_sun from the Sun at a heliocentric latitude of ~-50 degrees. In future work we will improve our ability to detect these "stationary" plasma parcels and build a catalog of measured wind speeds.
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