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Evolution of the Heliospheric Current Sheet during a Parker Solar Probe - Solar Orbiter radial alignment

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Helios 1 & 2 opened a new era as they allowed for synergistic observations of the solar wind. In particular, there have been studies about the radial evolution of what can be considered the same solar wind parcel passing through both spacecraft when they were radially aligned during so called "plasma line-ups". The recently launched Parker Solar Orbiter (SolO) are great new opportunities for such studies. Results of plasma line-ups studies are however strongly dependent on the considered time intervals. We propose here a new solar wind propagation method allowing to identify what we believe to be the same plasma passing through PSP (~0.075 au) & SolO (~0.9 au) during a radial alignment. We show the matching of two density structures (with radial lengths of ~ 10^7 km), corresponding to crossings of the Heliospheric Current Sheet on both spacecraft. Data also indicate the development of Stream Interaction Region during the plasma propagation. The unperturbed slow wind observed at PSP has indeed been caught up by a faster wind, creating a propagating discontinuity and trailing compression region, eventually engulfing the Heliospheric Current Sheet.





