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Solar wind modelling with EUHFORIA and the PSP observations

The recently available observations of the solar wind by Parker Solar Probe (PSP) at close to the Sun distances show large variations. Majority of attempts to model solar wind with EUHFORIA (European heliospheric forecasting information asset, Pomoell & Poedts, 2018), along the PSP trajectory, provided not very accurate modelling results. In attempt to understand the source of this inaccuracy, we studied the solar wind observed during the first ten perihelion of PSP. Number of intervals of enhanced solar wind velocity appearing simultaneously with the decrease of the solar wind density was found, indicating that this solar wind is originating from the coronal holes. Employing the magnetic connectivity tool (developed by ESA's MADAWG group) we confirmed the sources of that enhanced solar wind to be small coronal holes. In this study we present the characteristics of the solar wind flows originating from such a small coronal holes and compare them with characteristics of the fast solar wind originating from the large coronal holes, at close to the Sun distances. We discuss on the possible reasons for the lack of the fast solar wind in the PSP observations. In addition, we compare the characteristics of solar wind observed at close to the Sun distances and at 1 au.

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