9th Metis Workshop



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* Investigating solar wind outflow from open-closed magnetic field structures using coordinated Solar Orbiter and Hinode observations.

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The launch of Solar Orbiter allows us to study the solar corona at closer distances and from different perspectives, which helps us gain significant insights regarding the open question in solar physics concerning the origin of solar wind. In this work, we present an analysis of solar wind outflows from two locations: the S-web magnetic topology between two solar filaments, and the boundary of a small coronal hole. These outflows were observed off-limb by the Metis coronagraph onboard the Solar Orbiter and on-disk by the EIS spectrometer onboard Hinode, during the Coronal-Hole Boundary Expansion SOOP campaign on 9 April 2023. The magnetic field extrapolations suggest that the upflow regions seen in EIS were connected with the outflowing solar wind in Metis. Hence, this observation provides a unique opportunity to study the solar wind in the formation region in the low corona and the acceleration region in the middle corona at the same time. This work aims to explore the evolution of solar wind from two different source regions in the distance from 1-3 solar radii. We analyse and compare the electron density and outflow velocity inferred from the two source regions, at two different heights in the corona. We also investigate the relationship between the evolution of visible-light features in the middle corona and the EUV features in the low corona. These new results will provide a better understanding of the formation and acceleration process of the solar wind and how the variability of the source regions contributes to it.

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