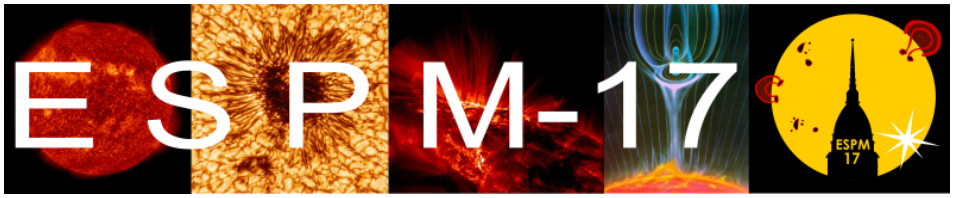


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# Comparison of the photospheric line-of-sight velocity measured by SO/PHI-HRT and SDO/HMI

Since its launch in February 2020, Solar Orbiter (SO) has been providing high-quality data from the many layers of the solar atmosphere. The Polarimetric and Helioseismic Imager onboard SO (SO/PHI) is a spectropolarimeter scanning the Fe I line at 617 nm, the same line sampled by SDO/HMI and many other on-ground instruments providing data of the solar photosphere. A first comparison of the magnetic field vector obtained by SO/PHI and SDO/HMI has already been discussed in Sinjan et al. 2023 and Moreno Vacas et al. 2024. Here we compare the line-of-sight velocity measured by the High Resolution Telescope (HRT) of SO/PHI and SDO/HMI. The goal of this comparison is multi-purpose: firstly, reliable measurements of up- and down-flows from SO/PHI-HRT are crucial when SO is facing the far side of the Sun; secondly, a good cross-calibration is mandatory to achieve stereoscopic measurements of horizontal flows from two vantage points. For this purpose, we compare the line-of-sight velocity measured by SO/PHI-HRT and SDO/HMI on 29 March 2023, when SO was crossing the Sun-Earth line at 0.39 au from the Sun. The results show good agreement between the two different instruments. Instrumental effects and large scale velocities on the Sun are also considered, but a deeper investigation is needed to carefully treat and understand the deviation between the two instruments.

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