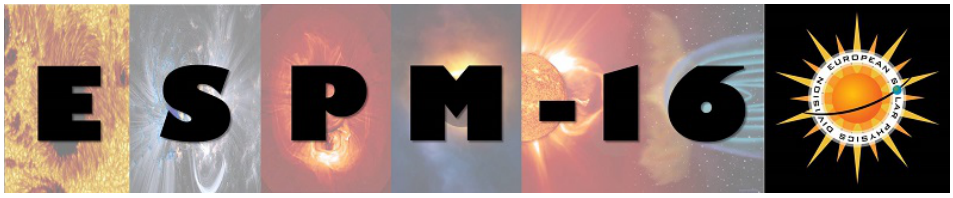

Contribution ID: **308** Type: **Poster**

Disambiguation of vector magnetograms by stereoscopic observations from SDO/HMI and Solar Orbiter/PHI

Tuesday, 7 September 2021 09:13 (13 minutes)

Spectropolarimetric reconstructions of the photospheric vector magnetic field are intrinsically limited by the so-called 180° ambiguity in the orientation of the transverse component. The successful launch and operation of Solar Orbiter has made the removal of the 180°-ambiguity possible using solely observations obtained from two different vantage points. While the exploitation of such a possibility is straightforward in principle, it is less so in practice and it is therefore important to assess the accuracy and limitations, as a function of both the satellites orbits and measurement principles. In this work we present a stereoscopic disambiguation method (SDM) and discuss a thorough testing of its accuracy in applications to modeled active regions and quiet Sun observations. The SDM is proven to to reach a 100% disambiguation accuracy when applied to moderately-to-well resolved fields. In such favourable conditions, the accuracy is almost independent of the satellites relative position, with the obvious exceptions of configurations where the satellites are within few degrees from co-alignment or quadrature. Even in the case of disambiguation of quiet Sun magnetograms with significant under-resolved scale, the SDM provides an accuracy between 82% and 98% depending on the field strength. Additionally, we provide an example of the expected accuracy as a function of time that can be used to optimally place remote-sensing windows during Solar Orbiter observation planning. Finally, a preliminary discussion of the effect of the viewing angle on the observed field as modeled by Solar Orbiter instrument simulations is presented.

Primary author: VALORI, Gherardo (MPS)

Co-authors: LÖSCHL, Philipp (Max Planck institute for Solar System Research); Dr STANSBY, David (UCL/MSSL); Dr PARIAT, Etienne (LESIA, Observatoire de Paris, Universit´e PSL, CNRS, Sorbonne Universit´e, Universit´e deParis, France); HIRZBERGER, Johann (MPS); CHEN, Feng (Nanjing University)

Presenter: VALORI, Gherardo (MPS)

Session Classification: Poster Session 3.2

Track Classification: Session 2 - The Solar Atmosphere: Heating, Dynamics and Coupling