# SO/PHI data request form

(Cruise phase + first science orbit; SO/PHI-Team internal version)

## Stereoscopic disambiguation of vector magnetograms

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# Science case

Remote observations of a same area on the Sun from different vantage points opens a novel possibility for removing the intrinsic ambiguity of the transverse component of the magnetic field. Differently from traditional single-view disambiguation methods, the equations for the stereoscopic disambiguation method (SDM hereafter) are exact for continuous magnetic fields.
The science case for the SDM is unique in providing the opportunity of the first observation-based resolution of the ambiguity in the transverse field. If successful, the SDM can be used to benchmark traditional single-view disambiguation methods, which are the run-of-the-mill of disambiguation (for PHI observation as well). To this goal, SO/PHI is mandatory as the only existing observatory providing magnetic field measurements away from the Earth-Sun line.

The accuracy of the SDM depends, among other factors, on the strength of the field and on the relative orientation of the field and of the two viewing points. An active region observed at high-resolution would offer the possibility of applications to physically relevant areas (umbra, penumbra, internal emerging areas, polarity inversion lines, pores, and, possibly, quiet sun) that differ for such requirements.
The minimal application of the SDM would require at least one observation within a favorable range of viewing angle (phi in +/-(40-50) deg). An additional observation at smaller separation ( ~20deg) would be relevant for minimizing the effect of different optical paths, but still possibly allowing for the stereoscopic view to solve the ambiguity. A more extensive exploration of the performances of the SDM would require a wider range of separation angles. In the same spirit, application to both cruise phase and  NMP1 would offer a test for the accuracy of the SDM on different distances from the Sun. Therefore, in this data request, a minimal and an optimal set of parameters are proposed, which, depending on feasibility, can offer a more limited or a wider scope for testing and application.

# Special requests

Irregular cadence.
Because of the varying orbital speed of SO, the observation cadence is irregular. For instance, obtaining the set of observations for separation angles at +/-(20,25,30,35,40,45,50,55,60,65,70) deg requires to take measurement at intervals varying from 2 to 4 days over 30 days in the cruise phase, and approximately every day over 11 days in the NMP1.

Therefore, depending on the mission phase (cruising or NMP1) and the set of parameters used (minimal or optimal), the variable cadence needs to be adjusted accordingly.