

SO/PHI data request form

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

Sunspots and pores height measurements using stereoscopic observations

Amanda Romero Avila, Bernd Inhester, Johann Hirzberger

MPS

Science case (stay on one slide):

Please also state, why is PHI needed; why is the science unique?

SO/PHI in combination with other observatories provides the unique possibility to measure the heights of the undulating solar surface using stereoscopic methods.

Solar surface stereoscopy represents the first method measuring the photospheric heights in a direct manner. This allows to, e.g., obtain the Wilson depression in sunspots and pores on a geometrical scale, i.e. avoiding the transformation between optical and geometrical depth.

This science case provides therefore an independent method to evaluate the results obtained from alternative methods (based only on radiative transfer) to obtain geometrical heights of photospheric structures, more specifically sunspots, pores and granules. In addition, it will give a better understanding of the 3D structure of these solar surface structures.

Requirements/data (use additional slide if needed)

Besides best guess requirements, you may also list minimum requirements on the data

- Type of solar feature: [Active Regions \(sunspots and pores\)](#)
- HRT or FDT: [HRT and FDT](#)
- Physical parameters needed (available: B_LOS, vector B, v_LOS, I_c, raw data): [mainly I_C \(B_LOS and/or B_vector is helpful\); raw Stokes profiles to compare with alternative methods](#)
- Total length of observation: [single snapshots](#)
- Cadence (maximum 1 dataset/min): -
- Pointing needs (disc centre, limb, active region location, particular μ): [various \$\mu\$ angles to test the efficiency of the method](#)
- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): [Angle to Earth < 90 deg; various solar distances and separation angles to be tested](#)
- Total number of datasets: [single snapshots](#)
- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: [HRT: Full frame, FDT: full disk](#)
- Full resolution or 2x2, 4x4 binned data: [Full resolution](#)
- noise level (default 10^{-3}): [Default; SNR>500 for I_C](#)
- Co-observations with other instruments: [SDO/HMI ; \(Hinode/SOT and hi-res ground-based observations to be tested\)](#)

Special requests: [As co-alignment needs to be precise; geometrical models of the instruments are needed](#)