

SO/PHI data request form

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

# Validating photospheric tracking algorithms

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# Science case (stay on one slide):

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

- Tracking horizontal displacements on the solar surface is used in many applications in solar physics. Several techniques exist, as LCT, FLCT, ILCT, YAFTA, CST, DAVE, and comparisons have been made between them (e.g. Welsch et al. 2008). Despite the systematic errors and limitations of these algorithm, they are valuable tool in modern solar physics.
- We aim to test the results obtained by tracking algorithms in comparison with transversal velocity obtained by stereoscopic observations provided by Earth observatories and PHI, and measuring the effect of other systematic errors, as the CLV.
- This will be the very first time that such a test will be done by directly measuring the transversal velocity of the photosphere, and by observing the same region of the Sun from different vantage points.

# Requirements/data (use additional slide if needed)

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

- Type of solar feature: Quiet Sun
- HRT or FDT: HRT
- Physical parameters needed (available: B\_LOS, vector B, v\_LOS, I\_c, raw data): min: (I\_c, V\_LOS, B\_LOS); best: raw data
- Total length of observation: min: 2 hour; best: more than 8 hours
- Cadence (maximum 1 dataset/min): 1 minute
- Pointing needs (disc centre, limb, active region location, particular  $\mu$ ): Depending on the angle to the Earth
- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): angle to the Earth  $\sim 30 - 60$  deg
- Total number of datasets: at least 120
- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: min: 512x512, best: full frame
- Full resolution or 2x2, 4x4 binned data: full resolution
- noise level (default  $10^{-3}$ ):  $10^{-3}$
- Co-observations with other instruments: HMI, ground facilities if possible
- Special requests: Stereoscopic observation (possible off-pointing). At least 8 hours of observation at HiRes and HiCad is needed for granulation tracking. If the requirements cannot be satisfied, we would be happy to have this observation during the second orbit.