

SO/PHI data request form

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

Testing far side imaging based on GONG data

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Science case (stay on one slide):

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

Far side imaging is a technique able to grasp the magnetic activity of the far side of the Sun, not visible from Earth. The inference method relies on the analysis of sound wave travel times, which is used to predict the location of accumulations of magnetic flux on the far side of the Sun (González Hernández, I.; Hill, F.; Lindsey, C., 2007, ApJ, 669, 1382). Using time series of solar surface velocity data, inferred from instruments like GONG, far side imaging of the Sun is currently being available in a daily basis. So far, far side imaging has been successful to some extent. It is able to predict the appearance of large active regions. This was tested with different methods, e.g., active regions rotating from the far side of the Sun into the field of view from Earth, and likewise, dissipating when rotating out of the field of view. However, a proper calibration of the detected magnetic fluxes require the direct observations of active regions located on the far side. Solar Orbiter PHI is the only instrument capable of providing such observations.

Here we request data for cross-calibrating the far side images provided in a daily basis by GONG. The underlying idea is to first, cross-calibrate PHI with GONG using front side data and then cross-calibrate GONG far side predictions with PHI far side observations. This will allow GONG to not only qualitatively forecast the far side magnetic activity but also to provide flux calibrated far side information.

Requirements/data (use additional slide if needed)

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

- Type of solar feature: [Front side and Far side FDT \(or HRT\) observations](#)
- HRT or FDT: [FDT \(although HRT is also usable\)](#)
- Physical parameters needed (available: B_LOS, vector B, v_LOS, I_c, raw data): [raw data](#)
- Total length of observation: [several days; at least one week](#)
- Cadence (maximum 1 dataset/min): [1 per day](#)
- Pointing needs (disc centre, limb, active region location, particular μ): [from front side and far side \(conjunction\) FDT maps](#)
- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): [N/A](#)
- Total number of datasets: [minimum 7 datasets, covering, at least, a week of Earth and far side \(near conjunction\) would be necessary](#)
- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: [Full frame](#)
- Full resolution or 2x2, 4x4 binned data: [Full resolution](#)
- noise level (default 10^{-3}): [Default](#)
- Co-observations with other instruments: [GONG](#)
- Special requests: [First calibration steps are doable using cruise phase PHI data](#)