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

Magneto-hydro-static modelling of the quiet Sun

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MPS

Science case (stay on one slide):
Please also state, why is PHI needed; why is the science unique?

- We request PHI/HRT data for the purpose of developing an automatic computational tool to extrapolate the photospheric magnetic field measured with SoLO/PHI/HRT into the chromosphere and corona.

- While the coronal magnetic field is force-free, we need to consider plasma forces (pressure gradient force and gravity force) in the photosphere and chromosphere by employing our magneto-hydro-static (MHS) model.

- PHI/HRT produces high resolution magnetic-field measurements that can help to resolve the thin (about 2 Mm) non-force-free layer between the photosphere and the corona. The vertical resolution of the MHS-model scales with the horizontal resolution of the measurements from Phi. The linear MHS-model uses the LOS magnetic field as a boundary condition.

- Free model parameters will be optimized using a Simplex-Downhill minimization by comparing the model magnetic field with observations from SoLO/EUI.

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): B_LOS

- Total length of observation: Any, MHS-model treats each snapshot separately

- Cadence (maximum 1 dataset/min): Any

- Pointing needs (disc centre, limb, active region location, particular μ): not specified

- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): not specified

- Total number of datasets: not specified

- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: all for testing and comparing

- Full resolution or 2x2, 4x4 binned data: all for testing and comparing

- noise level (default 10^{-3}): default is ok

- Co-observations with other instruments: EUI

- Special requests: No