

SO/PHI data request form

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

polar coronal holes and boundary evolution

Jonathan Nölke, Johann Hirzberger, Hardi Peter

Affiliations(s): MPS

Science case (stay on one slide):

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

Polar coronal holes (CH) are regions where one magnetic polarity dominates and the magnetic field lines are open to space. PHI observations provide the means to study the magnetic field under the CHs and at the boundary from polar CH to QS as well as to follow the evolution of this boundary (with EUV and SPICE), in particular the impact changes in magnetic flux have on the boundary itself.

The sensitivity and stability of PHI allow recording an uninterrupted time series over a longer period and co-observations with high-resolution EUV observations are crucial to understand the coupling of photospheric magnetic fields and the corona, in particular concerning small coronal structures . SPICE will provide information on the initial acceleration of the wind.

To follow the evolution of the CH boundary and the corresponding magnetic flux an observing sequence of about a day at a moderate cadence should be carried out. An additional short-term sequence at the highest cadence needs to be included to investigate the anticipated impact of flux emergence and cancellation on the CH boundary evolution.

Additionally, the obtained data can be used to extrapolate the magnetic field.

Provided raw data can be made available it would also be possible to study the shape and changes thereof of absorption line profiles at the CH boundaries.

Requirements/data (use additional slide if needed)

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

- Type of solar feature: polar CHs
- HRT or FDT: HRT
- Physical parameters needed (available: B_LOS, vector B, v_LOS, I_c, raw data): B_LOS, Inclination, optionally raw data (for observations of CH boundaries)
- Total length of observation: : 10 min – 1h (1 min cadence), 1 day (10 min cadence)
- Cadence (maximum 1 dataset/min): 1 min for 10 min – 1h (long enough to see the impact of flux emergence and cancellation), 10 min for 1 day (ideally)
- Pointing needs (disc centre, limb, active region location, particular μ): polar region
- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): AIA, 116 km/pixel at 0.32 AU
- Total number of datasets: > 150
- 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: EUV, SPICE, SWA
- Special requests: