SO/PHI data request form

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

True CLV of Magnetic Flux and the Mystery of the Missing Open Flux

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MPS

Science case (stay on one slide):

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

There is a mismatch in the amount of magnetic flux measured in situ in the heliosphere and the open flux at the solar surface. One reason for this could be that the magnetic flux measured at the solar poles (i.e. close to the limb) is underestimated.

Particularly for small scale magnetic structures the measurement of the transversal magnetic flux is limited and assumptions, e.g. vertical fields and that no other effect leads to a drop of flux near the limb, have to me made. This leads to the science case:

- Test these assumptions and find the True CLV of the magnetic flux
- Requires two different viewpoints at the same location of the Sun are required, one provided by PHI, the other from a similar polarimeter from the Earth-Sun Line (HMI etc.)
- Such an investigation is unique as it has not been possible before: no instrument with SO/PHI's capability has moved out of the Earth-Sun Line

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 Region/Network and Plage
- HRT or FDT: Both (HRT preferred, FDT at close distance)
- Physical parameters needed (available: B_LOS, vector B, v_LOS, I_c, raw data): I_c+B-vector; raw data will provide higher accuracy
- Total length of observation: snapshots at various μ values (HRT); snapshots at close distance (FDT); short time series will give augmented science (evolution of flux)
- Cadence (maximum 1 dataset/min): 1-5 min
- Pointing needs (disc centre, limb, active region location, particular μ): various μ values
- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): Earth visibility; 0-90 degrees
- Total number of datasets: 10-50
- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: 2k x 2k (smaller fields possible – co-alignment with NEO required)
- Full resolution or 2x2, 4x4 binned data: Full resolution
- noise level (default 10^{-3}): 10^{-3}
- Co-observations with other instruments: Hinode and/or HMI; Ground based instruments: tbd (if co-alignment is possible)
- Special requests: none