SO/PHI data request form

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

Deep Probing Helioseismology

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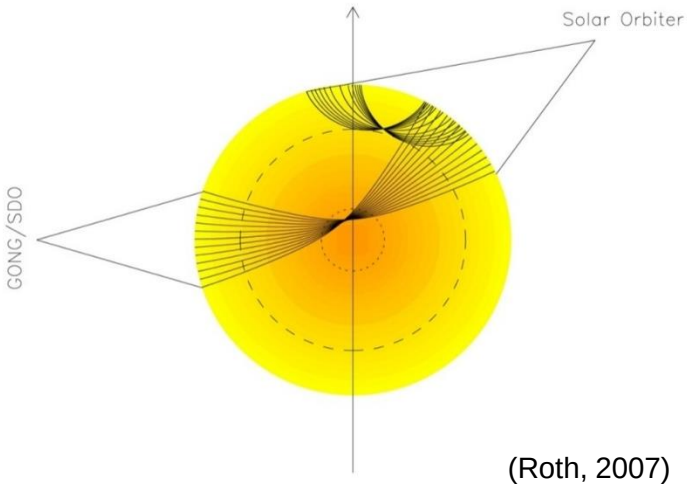
KIS

Science case (stay on one slide):

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

- Large-scale flows (differential rotation, meridional flow) in the solar interior are considered relevant for the generation of the Sun's variable magnetic field.
- Currently probing the deep solar interior is limited, as only part of the solar surface can be observed.
- On the long-term: the combination of data from multiple venture points will help improving the helioseismic capabilities (Roth et al. 2016).
- This requires PHI as it is the only instrument that allows views on the Sun that are off the Earth-Sun line.
- The objective is
  - to start the preparations of combining data from PHI and SDO/GONG for helioseismology
  - based on the combined data, estimating the improvements in flow detection with global helioseismology (Schad et al. 2011, 2012, 2013; Schad & Roth 2020) by studying the so-called leakage matrix
  - Improving the capabilities of the helioseismic Fourier-Legendre analysis (Braun & Fan 1998, Roth et al. 2016) that can be made by extending the field of view, i.e. studying effects on systematics.



(Roth, 2007)

Requirements/data (use additional slide if needed)

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

- Type of solar feature: full Sun
- HRT or FDT: FDT
- Physical parameters needed (available: B_LOS, vector B, v_LOS, I_c, raw data): v_LOS
- Total length of observation: minimum 4 days
- Cadence (maximum 1 dataset/min): 1 dataset/min
- Pointing needs (disc centre, limb, active region location, particular μ): disc centre
- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): angle to Earth between 30° and 330°
- Total number of datasets: >5760
- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: crop to cover the full solar disk
- Full resolution or 2x2, 4x4 binned data: 2x2 binning is possible as long as 200 pixels cover the solar diameter
- noise level (default 10^{-3}): 10^{-3}
- Co-observations with other instruments: SDO or GONG
- Special requests: None