SO/PHI data request form

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

The center-to-limb variations in the helioseismic travel-time measurements from the PHI observations

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MPS

Science case (stay on one slide):

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

- PHI provides us an opportunity to observe the meridional flow in the polar regions. To measure the meridional flow using time-distance helioseismology, one needs to remove a major systematic error in the travel-time measurements, the center-to-limb variations (CLV).
- Previously I found that the magnitude of HMI's CLV depend on SDO's orbital motion. So the CLV obtained from PHI could be different from that of HMI due to different orbital motions, even they both measure the same spectral line.
- As a first step toward the measurement of the meridional flow in the polar regions, I would like to determine the CLV from PHI and compare with that from HMI.
- To investigate the CLV in a different aspect, I would also like to measure the time lag between the Doppler signals viewed by the two instruments, which is expected to be consistent with the CLV obtained from the travel-time measurements.
- The result of this work will be used to determine the meridional flow in the polar regions if possible. This work will also provide useful information for the mode physics where the CLV may come into play in the measurement of the phase shift between the Doppler signals viewed from different vantage points.

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, full solar disk
- HRT or FDT: full-disk images
- Physical parameters needed (available: B_LOS, vector B, v_LOS, I_c, raw data): v_los
- Total length of observation: ideally 10 days (if not possible, I would combine multiple observation windows)
- Cadence (maximum 1 dataset/min): 60 sec
- Pointing needs (disc centre, limb, active region location, particular μ): disk center
- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): overlap with HMI (80%~90%)
- Total number of datasets:
- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: full solar disk
- Full resolution or 2x2, 4x4 binned data: the resulting solar diameter of at least 500 pixels
- noise level (default 10-3):
- Co-observations with other instruments: HMI
- Special requests: