SO/PHI data request form

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

Mode Excitation

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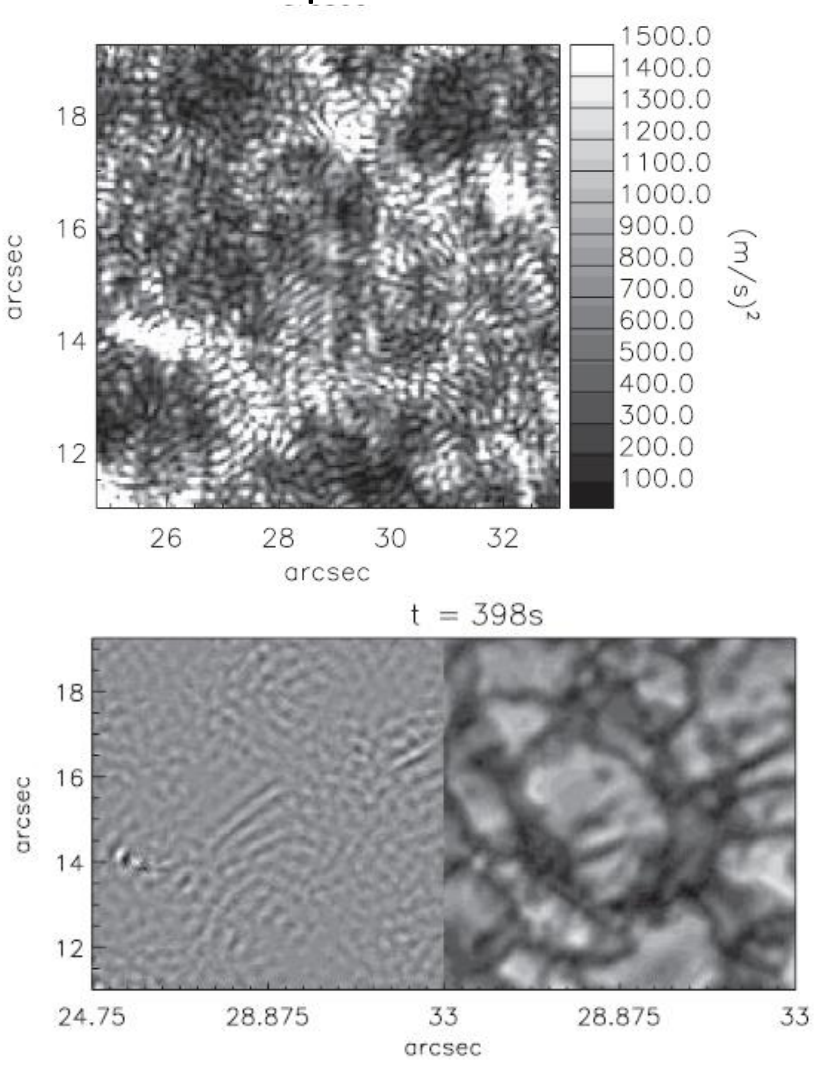
Science case (stay on one slide):

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

- The excitation mechanism of solar oscillations is mostly not understood
- Knowledge on the source mechanism is an important ingredient for
  - Various helioseismic techniques:
    - Local helioseismology needs it for a proper calculation of the kernel functions, i.e. mode sensitivities. This requires to know the statistical properties of the mode excitation (source function)
    - Global helioseismology needs it for the eigenfunction perturbation analysis as relevant information about the vertical-to-horizontal displacement ratio, i.e. velocity vector.
  - The behaviour of the eigenfunction (amplitude, energy dissipation) in the atmosphere depends on the source function, therefore it affects the estimates on the energy transfer from the interior to the photosphere – chromosphere – corona acoustic waves.
- The high spatial resolution of PHI is needed to resolve the intergranular lanes without the perturbing effect of the Earth's atmosphere
- HMI has not the required resolution.



(Sunrise observations, Roth et al. 2010)

Requirements/data (use additional slide if needed)

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

- Type of solar feature: Granulation
- HRT or FDT: HRT
- Physical parameters needed (available: B_LOS, vector B, v_LOS, I_c, raw data): v_LOS, (vector B if activity is in the field of view), I_c
- Total length of observation: minimum 2 hours
- 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): spatial resolution between 116 km/pixel – 130 km/pixel
- Total number of datasets: 120
- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: minimum 1kx1k; ideally full frame
- Full resolution or 2x2, 4x4 binned data: full resolution
- noise level (default 10^{-3}): 10^{-3}
- Co-observations with other instruments: none
- Special requests: None