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

Heating of coronal loops: magnetic footpoint dynamics

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MPS

Science case (stay on one slide):
Please also state, why is PHI needed; why is the science unique?

- Numerical models of a coronal loop show the complex magnetic interaction from the photospheric levels into the coronal parts of the loop. In some cases internal rotation of the magnetic footpoints can be shown to be related to bright strands within the loop. Through a combination of high-resolution observations with EUI/HRI/174 and PHI/HRT we aim to study how the evolution of the photospheric magnetic field can govern the structure of strands forming a (bundle of) coronal loop(s). Based on experience from Hi-C we can expect EUI/HRT/174 to reveal some sub-structure within active region coronal loops. At matching resolution PHI will provide the evolution of the magnetic footpoints. Certainly, PHI should be able to isolate the relative dynamics between individual magnetic patches at the loop footpoints, and with some luck PHI might even reveal the internal motions within these magnetic patches. This would provide insight into the location of the generation of the energy flux into the loop.
- This is linked to "Loop brightenings: what is happening at the footpoints?"

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**

- HRT or FDT: **HRT**

- Physical parameters needed (available: B_LOS, vector B, v_LOS, I_c, raw data): **B_los, I_c**

- Total length of observation: **1 hour**

- Cadence (maximum 1 dataset/min): **1 min**

- Pointing needs (disc centre, limb, active region location, particular μ): **active region, best inside μ=0.5**

- Orbit needs (spatial resolution/co-rotation/angle to Earth/angle to other spacecraft): **inside 0.5 AU (resolution)**

- Total number of datasets: **60**

- Full frame 2k x 2k or partial frame 1kx1k, 0.5kx0.5: **full frame (to maximize FOV)**

- Full resolution or 2x2, 4x4 binned data: **full resolution**

- noise level (default 10^{-3}): ???

- Co-observations with other instruments: EUI/HRI/174; EUI/HRI/Lya; SPICE (for thermal context of diffuse corona)

- Special requests: