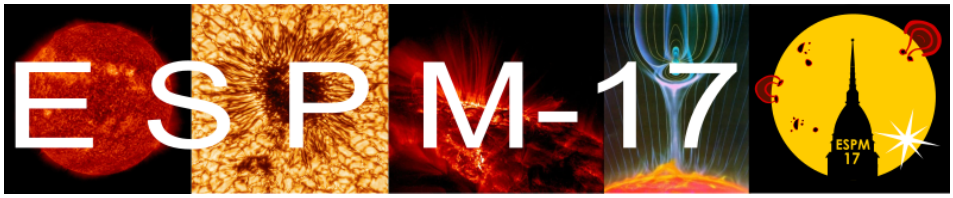

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Spectroflat: A generic spectrum and flat-field calibration library for spectro-polarimetric data

Flat fielding spectro-polarimetric data with one spatial and one spectral dimension is inherently difficult and therefore its potential is often not fully exploited. Flat fielding approaches for spectrographs are rarely described in detail, approaches for polarimeters have not been described at all so far. Moreover, the tools needed to calibrate data of a similar type are usually re-invented per instrument.

We present an instrument independent approach for diffraction-grating-based, long-slit spectrographs combined with temporally modulated polarimetry from high-resolution solar telescopes.
It allows for flat-field calibration data to be obtained during regular flat fielding procedures in the observational configuration of the instrument.
We have created robust python libraries that can be plugged into existing pipelines or used standalone.
The libraries perform a field-dependent many-line smile correction, extract flat field maps for slit and sensor dust features, and can provide wavelength calibration based on selected solar atlases.

After calibration, the photon noise level can be closely attained in Stokes Our method derives in robust and precise spectropolarimetric inversion results.
Our correction works across the full spectral range. The algorithm was tested for different wavelength regimes with emission (EUV range) or absorption (near-UV, VIS, IR range) spectra, on data acquired with ground-based, balloon-borne, and space-based instruments.

Our tools extends flat-field techniques to modern instruments with large imaging sensors, covering many spectral lines simultaneously, and with polarimetric capabilities, where methods described so far are not adequate.
We invite the solar community to use our library in their instrument pipelines and contribute to its joint development.

Primary author: HÖLKEN, Johannes (Max Planck Institut für Sonnensystemforschung)

Co-authors: DOERR, Hans-Peter (Thüringer Landessternwarte, Tautenburg, Germany and Max-Planck-Institut für Sonnensystemforschung (MPS), Göttingen, Germany); FELLER, Alex J. (Max-Planck-Institut für Sonnensystemforschung (MPS), Göttingen, Germany)); Dr IGLESIAS, Francisco (Max Planck Institute for Solar System Research)

Session Classification: Coffee break and poster session 2

Track Classification: Diagnostic tools and numerical methods in solar physics