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SpecpolFlow: a new Pythonic workflow for spectropolarimetry

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Abstract. The SpecpolFlow package is a new, completely Pythonic implementation of software supporting the analysis and interpretation of optical spectropolarimetry from astronomical sources spanning the HR diagram. Its tools enable the normalization and processing of stellar spectra, including measurements of the longitudinal magnetic field, in a streamlined, user-friendly pipeline from telescope to science product. SpecpolFlow's design in a modern, open-source, free-to-use platform supports user accessibility, and the longevity of its analytic tools is actively maintained by its developers. The SpecpolFlow team regularly publishes detailed tutorials that can be used by students, instructors, or experts alike. We announce the official release of SpecpolFlow, available via the pip package manager or GitHub, and highlight key scientific results from the first publications utilizing SpecpolFlow for spectropolarimetry.

Keywords. spectropolarimetry, stellar magnetic fields, astronomy software, open source software, astronomy data visualization

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`SpecpolFlow` is an open-source, Python-based software pipeline for analyzing spectropolarimetric data. It can be run from the command line or through a source code editor, and contains tools to

- reformat observed spectra into a standardized file type;
- normalize spectra to the continuum with an interactive graphical user interface;
- Assemble and interactively edit Least Squares Deconvolution (LSD) line masks from atomic line catalogs; and
- calculate LSD profiles, line bisectors, radial velocities, and longitudinal magnetic field $\langle B_z \rangle$ values.

`SpecpolFlow` unifies legacy codes into a customizable workflow that is extensively documented and designed for accessibility. The website† also contains comprehensive tutorials (including Jupyter notebooks and Colab examples) for flexible workflows and batch processing. `SpecpolFlow` has been published in the Journal of Open Source Software (Folsom et al. 2025).

† https://folsomcp.github.io/specpolFlow/

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Supplementary material

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