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Development of a solar/stellar wide-spectral coverage polarimeter for investigating flare energetics

The solar/stellar wide-spectral coverage polarimeter, SOWISP, is a dedicated instrument for investigating time-dependent energetics of solar flares. With four-state polarisation measurements and a field-of-view the size of an average sunspot, the instrument, currently in the R&D phase, will allow to probe changes in the magnetic structure with a spatial resolution of below 20 arcsec. Unique among spectropolarimeters is its large spectral range in the visible regime, which includes the Balmer and Paschen continua from 350 nm, as well as lines from the hydrogen Balmer series, up to the chromospheric Ca II 854.2 nm line. Observations of both the continua and line spectra over this range, with a targeted spectral resolving power of 30k at 600 nm, will elucidate the heating and energy conversion mechanisms at different atmospheric heights in flares and allow to discriminate between models.

The spatial and spectral resolution will be achieved through the use of an integral field unit and a primary Echelle disperser, respectively. Designed for portability and through phased deployment, the instrument also lends itself to the study of stellar magnetic field variations, particularly of bright M dwarfs, by utilising our own 80 cm ZimMAIN telescope at our Zimmerwald Observatory, or by bringing SOWISP as a visitor instrument to other telescopes worldwide.

This presentation will describe the science goals, design and ongoing development of SOWISP, with emphasis on its unique and versatile spectropolarimetric capabilities for investigating the underlying mechanisms behind both solar and stellar flares.

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