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Working Title of Poster: Solar Cycle-Related Variability of Sun-as-a-Star Spectral Line Profiles

Abstract:

We use daily observations of the Sun-as-a-star by the high-resolution Integrated Sunlight Spectrometer (ISS), one of three instruments which comprise the Synoptic Optical Long-term Investigations of the Sun (SOLIS) facility, to investigate solar cycle-related variability in photospheric line profiles of three ISS spectral bands. Preliminary results show an anti-correlation between the magnitude of the CN band-head jump and total unsigned magnetic flux through the decline phase of Solar Cycle 23 and the rise and fall of Solar Cycle 24, consistent with magnetohydrodynamic simulations. Additional line parameters (core intensity, full width at half maximum and equivalent width) show correlations with the solar cycle, but may require correction for stray light. We investigate two such corrections. Varied line parameter responses to thermodynamic and magnetic structures in the solar atmosphere may provide a means of disentangling thermal and magnetic effects in disk-integrated solar spectra. These line parameter responses could in turn inform spectroscopic observations of other stars. Ultimately, this work is a step towards a better understanding of magnetic activity cycles in other Sun-like stars.