Title: Photometric Properties of Solar Faculae: Comparison of MHD Simulations with Observations
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Abstract: Solar radiation, and its variations at different temporal scales, are known to affect the Earth atmosphere and climate. Measurements of irradiance variations obtained at different wavelength ranges are therefore extremely important to understand and model the physical processes that describe the interaction of solar radiative energy and Earth atmosphere, which, in turn, are fundamental to understand long term climate changes. Unfortunately, obtaining long (at least one solar cycle) and reliable time series is an extremely difficult task, due to the degradation of space-based observations, as well as to the intrinsic differences of measurements obtained with different instruments. Models of irradiance variations obtained from the analysis of ground and space-based observations complement these measurements, and are fundamental to reconstruct the irradiance at times prior to the space era. Nevertheless, discrepancies between different models, and between models and observations are still relevant for climatological studies.

Models of irradiance variations based on the use of state-of-the-art magneto hydrodynamic simulations (MHD) are under development. Here we investigate whether, and to what extent, MHD simulations obtained with the Stagger code can reproduce photometric properties of facular regions in the photosphere derived from observations obtained at the Dunn Solar Telescope.