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Modeling the variability of Sun-like stars

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We present a model which attributes the variability of the stellar radiative energy flux to the imbalance between the contributions from dark starspots and bright faculae. The stellar radiative energy flux variations are modeled from the individual component's spectra, by weighting them with corresponding filling factors. The filling factors are deduced by extrapolating the sunspot and facular filling factors dependencies on solar CaII S-index to stars with different levels of the chromospheric activity.
Our approach allows us to model the stellar photometric variability vs. activity dependency and reproduce the transition from spot-dominated to facula-dominated regimes of variability. We show how the effect of inclination (arising due to the random position of the Earth-bound observer relative to the directions of stellar rotational axis) can affect these dependencies and present the modeling of the individual stellar photometric light curves.