Connecting Solar and Stellar Brightness Variations

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We expand SATIRE, which is a successful model of solar brightness variability, from the Sun to other stars. This allows constraining SATIRE over wide space of possible stellar parameters and thus, along with interpreting stellar data, it helps to better identify the mechanisms of solar variability. This is, in turn, important for better understanding the solar-terrestrial connection.

Our results suggest that the solar paradigm is remarkably successful in explaining the stellar brightens variations on the activity cycle timescale. In particular, the model reproduces the observed reversal of the in-phase activity-brightness relationship for low-activity stars to an anti-phase one for more active stars.

We simulate the solar variability as it would be measured out-of-ecliptic by Kepler and CoRoT and discuss the relative contributions of spots and faculae to the photometric stellar variability.