

How Typical is the Sun as a Variable Star?

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Solar brightness varies on all timescales that have ever been resolved or covered by space-born instruments. Driven by the climate community's interest in links between solar variability and climate change, our understanding of solar brightness variations has dramatically improved over the last decade. Concurrently with solar studies, ground-based photometric measurements of Sun-like stars revealed brightness variations similar to solar variability on the 11-year activity timescale but with much wider variety of patterns. Surprisingly, several studies found the variability of solar brightness on the activity cycle timescale to be anomalously low in comparison with Sun-like stars. This posed the oxymoronic question of whether the Sun is actually a Sun-like star.

The interest in this question, and solar-stellar connections in general, was further elevated by the unprecedented precision of stellar brightness measurements achieved by the CoRoT and Kepler space missions. In particular, there have been a number of studies based on Kepler data aimed at understanding whether brightness variations of the Sun at timescales from days to weeks are typical or rather weak compared to the cohort of Sun-like stars. These studies led to a contradictory results and the unambiguous answer to this question is still not found.

We review the progress in the solar-stellar comparison reached over the last few years and discuss the biases which can affect such a comparison.