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Title: Re-Opening Windows on Magnetic Activity from a Flaring G Dwarf in the Kepler Field
Type: Contributed Talk
Session: Stellar Activity, Rotation, Ages, Metallicity
Abstract: The discovery of exoplanets with the Kepler mission has enlivened interest in processes occurring on the Sun and stars as tools to understand these exoplanets better. We know the Sun is capable of violent events – flares that lead to coronal mass ejections (CMEs) and "space weather" – that have critical ramifications for us as humans. Similar violent, short-term events (flares) are seen on stars. Until recently, the quality of stellar data was inferior to that for the Sun, due partly to a dissimilarity in the types of objects being studied systematically, and the typically short length of observation time compared to solar monitoring.

The Kepler mission performed long term, high precision photometric monitoring of stars which enabled a systematic study of the flaring properties of individual stars. We focus on one flaring G dwarf in the Kepler archive, KIC11551430, which has over 180 days of short cadence observations. We report on the characterization and study of white light flares on this object, the first in-depth systematic study of white-light flaring on a solar-like star. We discuss methods of removing underlying large-scale photometric modulations and techniques to identify short timescale transient flare events. We amass a database of about 1700 flare candidates from this one object, from which statistics are derived. In particular, we examine evidence for a high energy cutoff in the flare frequency-energy distribution, which has implications for extrapolating solar flare models to more active stars. We also present spectroscopic observations, which lead to insight into the nature of the star, and a study of the high energy recordings of its magnetic activity.