Title: Detecting Short-term Stellar Magnetic Variability and Extracting the S-index from LCO NRES

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Abstract:

When observing magnetic activity in stars, this activity can be quantified in a number called the S-index, which was first defined in the long-running Mount Wilson Observatory (MWO) HK project. In time series obtained from MWO and the Lowell Observatory Solar-Stellar Spectrograph (SSS), short-term (less than ~3 years) cycles can be obscured by the long seasonal gaps in the observing record. This can be seen in the star HD 76151, in which we analyzed the 50 year long S-index time series and found the most probable period to be ~21 years. However, Baliunas et al. 1995 found this star to have a period of 2.5 years. A closer examination of this time series concluded that a ~2.5 year period was present. To observe these shorter cycles, we are using the Las Cumbres Observatory Network of Robotic Echelle Spectrographs (LCO NRES), which has a longer viewing season and better sampling due to its queue-based scheduling. From the NRES spectra, we use the Ca II H and K emission to construct the S-index. The method for extracting S-Indices from LCO NRES will be discussed, as well as the challenges faced when working with this new instrument.