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Correcting stellar activity from radial velocity measurements using frequency domain linear regression in exoplanet searches VICTOR RAMIREZ DELGADO, University of Delaware, JOAN CAICEDO VIVAS, Universidad del Valle , SARAH DODSON-ROBINSON, University of Delaware — High precision radial velocity (RV) measurements have created the need for better diagnostics of stellar activity in exoplanet detection. Stellar surface activity produces periodic and quasiperiodic signals such as rotation, and oscillations that can mimic or hide a real planet RV signal. We introduce a new computational method of correcting for stellar activity, by using data from indicators, such as Hα and S-index, that trace the activity from the surface of stars. Our algorithm performs Fast Fourier Transforms (FFT) on time series of RVs and activity indicators to analyze periodic signals from a target star. These manifest as peaks centered at different frequencies. To model the activity present in the RV, multiple linear regression is computed, using the indicator's FFTs as the explanatory variables, to predict the RV FFT. Our activity model is then transformed into the time domain and subtracted from the original RVs, and thereby obtain the residuals. Applying our method to the data set of CoRoT-7 (Queloz et. al (2009))(Haywood et. al (2014)), results in a significant power reduction in the peak coming from the star's rotation period. The peak associated with the period of planet c remains unaffected, providing promising results for the analysis efficacy.

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