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Extracting Radial Velocities of Cool, Low Mass Stars Using Forward Modeling with PARVI[1] KATELYN HORSTMAN, University of California, Los Angeles — Observations have shown exoplanets are abundant around type K & M stars. To search for companions around these cooler, low mass stars, we benefit from observing targets in near infrared (NIR) wavelengths (758 -1388 nm) where the star has its peak emission. We use observations from the Palomar Radial Velocity Instrument (PARVI) to measure radial velocities of type K & M stars. We present an addition to the existing data reduction pipeline created for PARVI that obtains stellar radial velocities from the one-dimensional spectra of the object. Using a forward modeling technique, we create a model spectrum to mimic the reduced spectrum taken from instrument observations. We focus on four factors when creating our model: a stellar template represented by high resolution PHOENIX models, the telluric absorption of the atmosphere, the blaze function, and line broadening. We apply our radial velocity data reduction pipeline to observations of GJ229 A and recover an estimated, best precision of 11 m/s. Our results are a first step toward showing PARVI can obtain the dynamical masses of candidate planets orbiting K & M stars detected by the NASA TESS mission.

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