**Project NIRRVS: Precise Near-Infrared Radial Velocity Surveys.** Peter Plavchan[1], Peter Gao, Jonathan Gagne, Elise Furlan, Michael Bottom, Cassy Davison, Sean Mills, David R. Ciardi, Angelle M. Tanner, Charles A. Beichman, Joseph Catanzarite, John A. Johnson, Russel J. White, Guillem Anglada-Escudé, Todd Henry, Kaspar von Braun, Bernie Walp, Lisa A. Prato, Nick Ogden, Garrett Pohl, Claire Geneser, Andrew Stufflebeam, & Joe Regan, [1]Missouri State University (peterplavchan@missouristate.edu; Kemper Hall 103N, 901 S. National Ave., Springfield, MO 65897)

We present precise radial velocity time-series from a 2.3 micron near-infrared survey to detect exoplanets around ~30 red, low mass, and young stars. We use the CSHELL spectrograph (R~46,000) at the NASA InfraRed Telescope Facility, combined with an isotopic methane absorption gas cell for common optical path relative wavelength calibration. We have developed a sophisticated RV forward modeling code that accounts for fringing and other instrumental artifacts present in the spectra. We are able to reach long-term radial velocity dispersions of ~30 m/s on our survey targets. With a spectral grasp of only 5 nm, this performance is near the expected photon and detector noise limit. We highlight future applications of our instrumentation and RV forward modeling code to iSHELL at IRTF (R~75,000). With iSHELL, we should be able to obtain a precision of less than 5 m/s in the near-infrared.

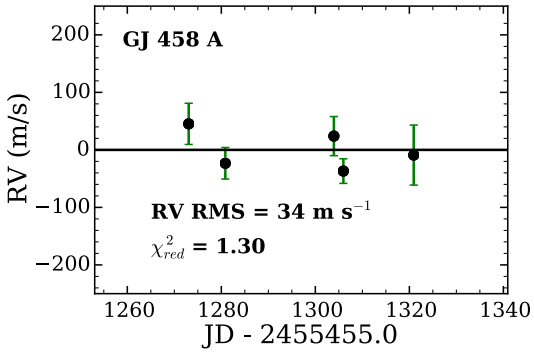


**Figure 1** Radial velocity time-series from Project NIRRVS for the M0 dwarf GJ 458 A (black circles with green one-sigma error bars), showing the achieved precision over an observing semester.

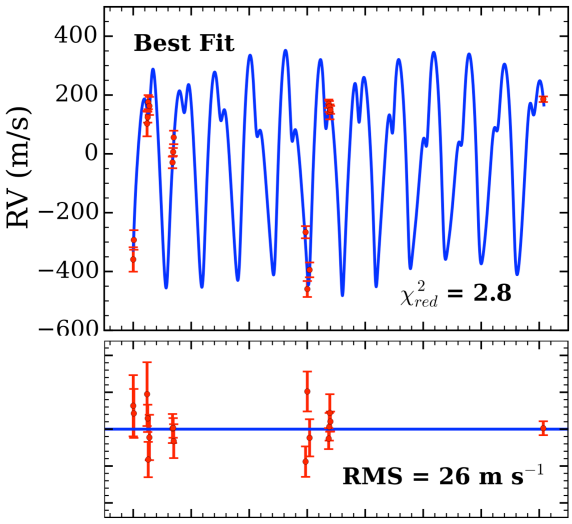


**Figure 2** ***Top:*** Radial velocity time-series from project NIRRVS for the known planet-hosting M dwarf GJ 876 (red data points) with a blue two-planet fit to the observations. ***Bottom:*** Residuals after subtracting the data from the model.