On-sky performance of the NEID Spectrometer over 2 years

Paul Robertson
UC Irvine

NEID is a new ultra-precise radial velocity spectrometer for the WIYN 3.5m Telescope at Kitt Peak National Observatory. It entered full science operations in 2021, and is open to the community via the NN-EXPLORE program. When including commissioning observations, NEID's observing baseline now exceeds 2 years on sky. Over that time, NEID has demonstrated Doppler precision well below 1 m/s for bright stars spanning the FGKM spectral classes. In addition to ongoing science programs through Guaranteed Time and Guest Investigator programs, NEID is collecting two legacy data sets that will allow the community to collaboratively develop and test techniques for mitigating stellar activity in RV time series. A Standard Star program monitors a small number of benchmark stars at high cadence, with data becoming public immediately. NEID also collects Solar RVs on every clear day, again with no proprietary period. I will discuss the instrument's current performance, focusing on the spectrometer's thermo-mechanical stability and how it translates to on-sky precision as demonstrated by the standard star observations. I will also highlight some early science results from the first years of NEID operations. Science results to date include Solar RV science, ultra-precise Rossiter-McLaughlin obliquity measurements, and mass determination for transiting exoplanets.