

Extreme Precision in Radial Velocity IV



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NEID fiber feed and barycentric correction

NEID is a high resolution ($R \sim 100,000$) fiber - fed Radial Velocity (RV) spectrograph, that will be commissioned at the 3.5 m WIYN telescope at Kitt Peak, USA. In this presentation, I will discuss the details of the NEID fiber feed, which contains octagonal and circular fibers. I shall discuss and share techniques we used to polish these fibers in custom fused silica pucks, FRD, scrambling and performance and testing of sub-sections of the feed.

To achieve the 1 cm/s precision in barycentric correction requires knowing the time of the observation to about 0.3 seconds, and an exposure meter. At this level of precision the flux variability depends on wavelength. I will discuss the design, integration and testing of NEID's chromatic exposure meter ($R \sim 100$), which will potentially enable barycentric correction separately for each of NEID's 118 spectral orders. I shall also discuss the design, testing and installation of the exposure meter. Finally, I shall talk about Barycorrpy, the Python implementation of Barycorr (Wright and Eastman 2014) which is now in use in the pipelines of HPF, CARMENES, and NEID.

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Track Classification: Error budget in EPRV