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The NEID Spectrometer CCD System

Detecting Earth-mass exoplanets using the Doppler method places stringent requirements on detector stability. NEID is a new Doppler spectrometer in development for the WIYN 3.5-m telescope at Kitt Peak National Observatory as part of the NN-Explore partnership. The wide spectral grasp of NEID (380-930 nm) requires a monolithic CCD detector with a large area, small pixels, and excellent quantum efficiency across the NEID bandpass. NEID employs a single, deep depletion CCD290-99 device from e2v having 9Kx9K pixels with 10-micron pitch and Astro Multi-2 AR coating. We describe the results of a detector characterization effort ongoing at the University of Pennsylvania. We present measurements of the thermal variation of the detector package during operation and a promising clocking-based method for reducing the amplitude of these thermal variations to the mK level.

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Track Classification: Instrument and calibration challenges