

TRL-5 EMCCD Controller for Space Applications

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ABSTRACT

We present the progress in characterization of a Nuvu Cameras CCCP controller designed for extreme low light imaging in space environment with the 1024x1024 Teledyne-e2V EMCCD detector. The controller was designed using space qualified parts and extensively tested including performance and thermal vacuum. The performance test results include the readout noise, clock-induced charges, dark current, dynamic range and EM gain. After these successful tests the controller has reached TRL 5. We also discuss the CCCPs integration in the coronagraph of the High-Contrast Imaging Balloon System project: a fine-pointing and optical payload for a future Canadian stratospheric balloon mission. This first space qualified EMCCD controller will enhance sensitivity of the future low-light imaging instruments for space applications such as the detection, characterization and imaging of exoplanets, search and monitoring of asteroids and space debris, UV imaging, and satellite tracking.

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