

Image Sensors for Precision Astronomy (ISPA 2024)



Contribution ID: 42

Type: **Oral presentation (20 minute)**

LSST Camera testing and optimization

Wednesday, 13 March 2024 16:10 (25 minutes)

The focal plane of the LSST Camera for the Vera C. Rubin Observatory consists of 189 science CCD sensors and sensors for guiding (8) and wavefront sensing (4). The science sensors are deep-depletion and back-illuminated 4k x 4k CCDs with segmentation of 16 channels, manufactured by both Imaging Technology Laboratory (ITL; ITL STA3800) and Teledyne E2V (E2V CCD250). Three CCDs are grouped and operated by one Readout Electronics Board (REB), which provides customizable bias voltages and variable clocking signals, and readouts signal from CCD outputs. In the course of construction, we have executed phased testing campaigns of the focal plane. We characterize the focal plane performance with uniform illumination and specialized scene projectors. We identified several non-idealities: distortion in flat images “tearing”, persistence, noise performance, bias stability, and gain stabilities. We also attempted mitigations of some of those non-idealities by different clocking and operation voltages as well as switching from unipolar voltages to bipolar voltages in parallel clock rails for E2V devices. We report our testing results and efforts on optimization.

contribution subject matter

CCD sensors

Keywords for your contribution subject matter (this will assist SOC in accurately characterizing your contribution)

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Session Classification: Systematics and Sensor Characterization

Track Classification: Major ISPA Workshop Tracks: Sensor and Systematics Characterization