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The Camera for the Vera Rubin Observatory- Science and Guider/Wavefront Rafts

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ABSTRACT

The instrument for the Vera Rubin Observatory (previously known as LSST) comprises a modular array of CCDs. The main imaging array contains 3.17 Gpix spanning 9.6 square degrees that is sampled at 0.2 arcsec/pixel. The imaging array is implemented as a modular assembly of 21 independent "science rafts", each containing a 3×3 mosaic of 4096×4096 pixel deep-depletion CCDs. The four corners of the camera contain "corner rafts" that contain a 4096×4096 pixel guide sensors and a pair of 2048×4096 pixel wavefront sensors that are positioned on either side of focus to obtain wavefront information. Each CCD has 16 output amplifiers. Subregions of the guiders are read out at a frame rate of 10 Hz while the shutter is open. The wavefront and science raft CCDs contain a total of 3088 channels that are read out in parallel, allowing the entire camera to be digitized in 2 seconds while meeting the read noise requirements of the system. The camera electronics reside within the vac-

uum system, and include a custom integrated circuit that performs correlated double sampling, providing signals to a bank of 18 bit high-precision analog to digital converters. The $f/1.2$ beam places stringent requirements on the planarity and flatness of the imaging array. This paper describes the design and implementation of the VRO camera, and initial performance characteristics.

1. TO DO

Maybe add sensor section?
Add Intro
Fix Tables
Finalize Authors
decide where sensor description goes.
Finalize figures (is there a standard?)
Add citations as appropriate
Add Acknowledgments