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Vera C. Rubin Observatory LSST Camera Design and Delivered Performance

(Dated: February 24, 2020)

ABSTRACT

A major overview paper with two main components: (i) as-built design, based on the design report with updates. This part can be prepared in advance. (ii) performance relevant to science, as determined during Camera fabrication and I&T. This part will be completed before or around the time of Camera delivery. It might be updated after Camera re-verification on the summit.

1. INTRODUCTION

Editor: S. Ritz
(1-2 pages)
Includes connections to other papers, starting with the Overview paper, and the LSST observatory system.
Starting point is LCA-11591, the Camera Final Design Report.

2. REQUIREMENTS AND DESIGN OVERVIEW

Editor: S. Ritz
(5-10 pages)

2.1. *Summary of requirements*

2.1.1. *Details of Camera requirements related to science performance*

2.1.2. *Summary of functional and related requirements*

2.1.3. *Additional requirements*

Mechanical, etc, will just be listed.

2.2. *Overview of Design*

...which will lead directly into the rest of the sections. We will likely follow the path of the light through the Camera.

3. OPTICS

Editors: S. Ritz and J. Wolfe
(8 pages)

3.1. *Refractive Optics*

3.2. *Filters*

3.2.1. *Filter performance*

4. CAMERA BODY AND MECHANISMS

Editors: S. Ritz and M. Nordby Camera body intro and overview.

4.1. *Filter Exchange System*

Editors: P. Antilogous and P. Karst (5 pages)

4.2. *Shutter*

Editors: M. Oriunno, M. Nordby (2 pages)

5. CRYOSTAT

Editors: M. Nordby Overview.

5.1. *Cryostat mechanical design and implementation*

5.2. *Vacuum system*

5.3. *Refrigeration and thermal control*

Editor: R. Schindler, will summarize the larger refrigeration system paper here. (4 pages)

5.4. *Utility trunk*

Editor: M. Nordby

6. FOCAL PLANE

There is a separate science rafts and corner rafts paper, so key points only will be summarized here. Editors: C. Stubbs
(8 pages)

6.1. *Science Rafts*

6.1.1. *Sensors*

6.1.2. *Electronics*

6.2. *Corner rafts*

7. CAMERA CONTROL SYSTEM AND DATA ACQUISITION

Editors: A. Johnson, M. Huffer, G. Thayer Includes data flow, control, and telemetry. (5 pages)

8. INTEGRATION AND TEST

Editors: A. Roodman and T. Bond (15-20 pages)

8.1. *Integration flow and tooling*

8.2. *Challenges*

8.3. *Results*

A long section...

8.4. *Operational constraints*

9. ON-SUMMIT OPERATIONS

Editor: M. Nordby Includes in-situ thermal environment control, capabilities for servicing,

10. SUMMARY

Editor: S. Ritz

APPENDIX

A. REFERENCES

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Acronym	Description
I&T	Integration and Test
LSST	Large Synoptic Survey Telescope