



Vera C. Rubin Observatory
Software Test Report

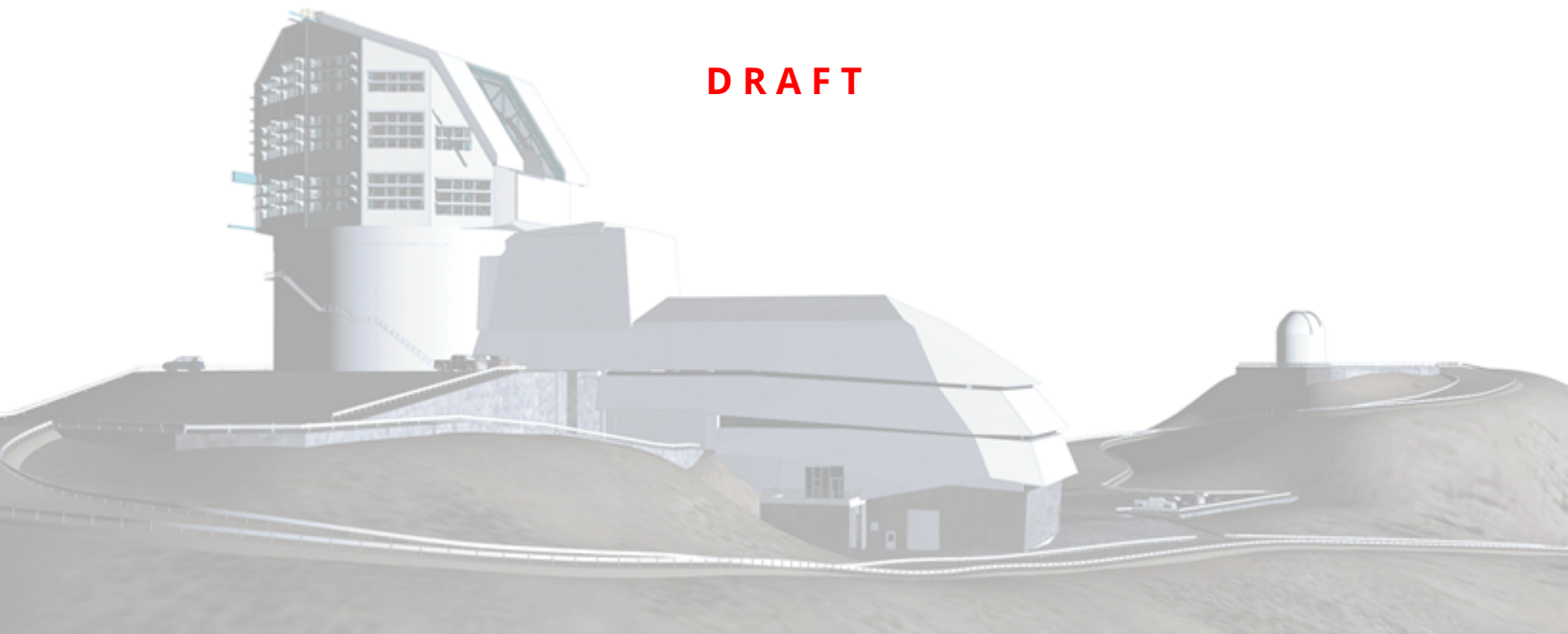
System-level Science Verification Acceptance Test Campaign: Photometric Calibration Test Plan and Report

Jeffrey Carlin

SCTR-116

Latest Revision: 2025-02-03

DRAFT



Abstract

This is the test plan and report for **Photometric Calibration** (System-level Science Verification Acceptance Test Campaign), an LSST milestone pertaining to the Project System Engineering and Commissioning.

This document is based on content automatically extracted from the Jira test database on 2025-02-03 . The most recent change to the document repository was on 2025-02-06.

Draft

Change Record

Version	Date	Description	Owner name
	2025-01-31	First draft	Jeff Carlin

Document curator: Jeff Carlin

Document source location: <https://github.com/lstt-dm/SCTR-116>

Version from source repository: 1e0df62

Draft

Contents

1 Introduction	1
1.1 Objectives	1
1.2 System Overview	1
1.3 Document Overview	1
1.4 References	1
2 Test Plan Details	3
2.1 Data Collection	3
2.2 Verification Environment	3
2.3 Entry Criteria	3
2.4 Exit Criteria	3
2.5 Related Documentation	3
2.6 PMCS Activity	3
3 Personnel	4
4 Test Campaign Overview	5
4.1 Summary	5
4.2 Overall Assessment	5
4.3 Recommended Improvements	5
5 Detailed Test Results	6
5.1 Test Cycle LVV-R301	6
5.1.1 Software Version/Baseline	6
5.1.2 Configuration	6
5.1.3 Test Cases in LVV-R301 Test Cycle	6
5.1.3.1 LVV-T1056 - Instrumental Calibration reproducibility	6
5.1.3.2 LVV-T1043 - Flat fielding errors -- effect on photometric repeatability	7
5.1.3.3 LVV-T3114 - Shutter Timing Allocations	8

5.1.3.4	LVV-T389 - Single Visit Photometric Repeatability	9
5.1.3.5	LVV-T390 - The spatial uniformity of photometric zeropoints	10
5.1.3.6	LVV-T3091 - Verify White Dwarf Flux Standards	11
5.1.3.7	LVV-T841 - Physical Scale Transform	11
A Documentation		13
B Acronyms used in this document		13

Draft

System-level Science Verification Acceptance Test Campaign: Photometric Calibration Test Plan and Report

1 Introduction

1.1 Objectives

This acceptance test campaign will verify system-level science performance metrics in the OSS and LSR associated with photometric calibration.

1.2 System Overview

None

1.3 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P135 Jira Test Plan and related Test Cycles (LVV-R301).

Section 1 provides an overview of the test campaign, the system under test (Science Verification), the applicable documentation, and explains how this document is organized. Section 2 provides additional information about the test plan, like for example the configuration used for this test or related documentation. Section 3 describes the necessary roles and lists the individuals assigned to them.

Section 4 provides a summary of the test results, including an overview in Table 2, an overall assessment statement and suggestions for possible improvements. Section 5 provides detailed results for each step in each test case.

The current status of test plan LVV-P135 in Jira is **Draft** .

1.4 References

- [1] **[DMTN-140]**, Comoretto, G., 2021, Documentation Automation for the Verification and Validation of Rubin Observatory Software, URL <https://dmtn-140.lsst.io/>, Vera C. Rubin Observatory Data Management Technical Note DMTN-140
- [2] **[DMTN-178]**, Comoretto, G., 2021, Docsteady Usecases for Rubin Observatory Constructions, URL <https://dmtn-178.lsst.io/>, Vera C. Rubin Observatory Data Management Technical Note DMTN-178
- [3] **[LSE-160]**, Selvy, B., 2013, Verification and Validation Process, URL <https://lsst.org/LSE-160>, Vera C. Rubin Observatory LSE-160

Draft

2 Test Plan Details

2.1 Data Collection

Observing is not required for this test campaign.

2.2 Verification Environment

None

2.3 Entry Criteria

None

2.4 Exit Criteria

None

2.5 Related Documentation

Docushare collection where additional relevant documentation can be found:

- None

2.6 PMCS Activity

Primavera milestones related to the test campaign: None

3 Personnel

The personnel involved in the test campaign is shown in the following table.

T. Plan LVV-P135 owner:		Jeffrey Carlin	
T. Cycle LVV-R301 owner:		Jeffrey Carlin	
Test Cases	Assigned to	Executed by	Additional Test Personnel
LVV-T1056	Jeffrey Carlin	Undefined	b''
LVV-T1043	Jeffrey Carlin	Undefined	b''
LVV-T3114	Jeffrey Carlin	Undefined	b''
LVV-T389	Jeffrey Carlin	Undefined	b''
LVV-T390	Jeffrey Carlin	Undefined	b''
LVV-T3091	Mostafa Lutfi	Undefined	b''
LVV-T841	Sam Schmidt	Undefined	b''

4 Test Campaign Overview

4.1 Summary

T. Plan LVV-P135:		System-level Science Verification Acceptance Test Campaign: Photometric Calibration		Draft
T. Cycle LVV-R301:		System-level Science Verification Acceptance Test Campaign: Photometric Calibration (ComCam)		Not Executed
Test Cases	Ver.	Status	Comment	Issues
LVV-T1056				
Execution	LVV-E3919	Not Executed	None	
LVV-T1043				
Execution	LVV-E3920	Not Executed	None	
LVV-T3114				
Execution	LVV-E3921	Not Executed	None	
LVV-T389				
Execution	LVV-E3935	Not Executed	None	
LVV-T390				
Execution	LVV-E3936	Not Executed	None	
LVV-T3091				
Execution	LVV-E3938	Not Executed	None	
LVV-T841				
Execution	LVV-E3939	Not Executed	None	

Table 2: Test Campaign Summary

4.2 Overall Assessment

None

4.3 Recommended Improvements

None

5 Detailed Test Results

5.1 Test Cycle LVV-R301

Open test cycle *System-level Science Verification Acceptance Test Campaign: Photometric Calibration (ComCam)* in Jira.

Test Cycle name: System-level Science Verification Acceptance Test Campaign: Photometric Calibration (ComCam)

Status: Not Executed

Test campaign supporting "System-level Science Verification Acceptance Test Campaign: Photometric Calibration" using ComCam.

5.1.1 Software Version/Baseline

b"

5.1.2 Configuration

b"

5.1.3 Test Cases in LVV-R301 Test Cycle

5.1.3.1 LVV-T1056 - Instrumental Calibration reproducibility

Version **1.0(d)**. Status **Defined**. Open *LVV-T1056* test case in Jira.

None

Preconditions:

None

Execution status: **Not Executed**

Final comment:

None

Detailed steps results LVV-R301-LVV-E3919 LVV-E3919-1454615356:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3919 LVV-E3920-1454617083:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3919 LVV-E3921-1454629378:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3919 LVV-E3935-1459750680:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3919 LVV-E3936-1459750682:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3919 LVV-E3938-1459966441:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3919 LVV-E3939-1459966442:

Note: Steps "Not Executed" and with No Result are not shown in this report.

5.1.3.2 LVV-T1043 - Flat fielding errors -- effect on photometric repeatability

Version **1.0(d)**. Status **Defined**. Open *LVV-T1043* test case in Jira.

Verify the effect of flat fielding errors on photometric repeatability

Preconditions:

None

Execution status: **Not Executed**

Final comment:

None

Detailed steps results LVV-R301-LVV-E3920 LVV-E3919-1454615356:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3920 LVV-E3920-1454617083:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3920 LVV-E3921-1454629378:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3920 LVV-E3935-1459750680:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3920 LVV-E3936-1459750682:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3920 LVV-E3938-1459966441:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3920 LVV-E3939-1459966442:

Note: Steps "Not Executed" and with No Result are not shown in this report.

5.1.3.3 LVV-T3114 - Shutter Timing Allocations

Version **1.0(d)**. Status **Draft**. Open *LW-T3114* test case in Jira.

Verify the shutter timing allocations

Preconditions:

None

Execution status: **Not Executed**

Final comment:

None

Detailed steps results LVV-R301-LVV-E3921 LVV-E3919-1454615356:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3921 LVV-E3920-1454617083:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3921 LVV-E3921-1454629378:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3921 LVV-E3935-1459750680:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3921 LVV-E3936-1459750682:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3921 LVV-E3938-1459966441:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3921 LVV-E3939-1459966442:

Note: Steps "Not Executed" and with No Result are not shown in this report.

5.1.3.4 LVV-T389 - Single Visit Photometric Repeatability

Version **1.0(d)**. Status **Defined**. Open *LVV-T389* test case in Jira.

Verify that the RMS of magnitudes in all filters and outlier rate of magnitudes is within specification

Preconditions:

Multi epoch observations of bright, isolated, unresolved, un-saturated stars, observed at varying photometric conditions, air mass, and water vapor.

Execution status: **Not Executed**

Final comment:

None

Detailed steps results LVV-R301-LVV-E3935 LVV-E3919-1454615356:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3935 LVV-E3920-1454617083:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3935 LVV-E3921-1454629378:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3935 LVV-E3935-1459750680:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3935 LVV-E3936-1459750682:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3935 LVV-E3938-1459966441:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3935 LVV-E3939-1459966442:

Note: Steps "Not Executed" and with No Result are not shown in this report.

5.1.3.5 LVV-T390 - The spatial uniformity of photometric zeropoints

Version **1.0(d)**. Status **Defined**. Open *LVV-T390* test case in Jira.

The distribution width (rms) of the internal photometric zero-point error (the system stability across the sky) will not exceed PA3/PA3u millimag, and no more than PF2 % of the distribution will exceed PF4 millimag. Applies to both bright and faint ends to constrain non-linearity of the flux scale

Preconditions:

None

Execution status: **Not Executed**

Final comment:

None

Detailed steps results LVV-R301-LVV-E3936 LVV-E3919-1454615356:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3936 LVV-E3920-1454617083:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3936 LVV-E3921-1454629378:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3936 LVV-E3935-1459750680:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3936 LVV-E3936-1459750682:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3936 LVV-E3938-1459966441:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3936 LVV-E3939-1459966442:

Note: Steps "Not Executed" and with No Result are not shown in this report.

5.1.3.6 LVV-T3091 - Verify White Dwarf Flux Standards

Version **1.0(d)**. Status **Approved**. Open *LVV-T3091* test case in Jira.

Create a catalog with WDs, plot distribution over the sky, calculate the distance between nearest neighbors, compare to the field of view of LSSTCam

Preconditions:

None

Execution status: **Not Executed**

Final comment:

None

Detailed steps results LVV-R301-LVV-E3938 LVV-E3919-1454615356:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3938 LVV-E3920-1454617083:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3938 LVV-E3921-1454629378:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3938 LVV-E3935-1459750680:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3938 LVV-E3936-1459750682:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3938 LVV-E3938-1459966441:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3938 LVV-E3939-1459966442:

Note: Steps "Not Executed" and with No Result are not shown in this report.

5.1.3.7 LVV-T841 - Physical Scale Transform

Version **1.0(d)**. Status **Defined**. Open *LVV-T841* test case in Jira.

The accuracy of the transformation of the internal LSST photometry to a physical scale (e.g. AB magnitudes) with an accuracy of PA6 (10 mmag).

Preconditions:

None

Execution status: **Not Executed**

Final comment:

None

Detailed steps results LVV-R301-LVV-E3939 LVV-E3919-1454615356:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3939 LVV-E3920-1454617083:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3939 LVV-E3921-1454629378:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3939 LVV-E3935-1459750680:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3939 LVV-E3936-1459750682:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3939 LVV-E3938-1459966441:

Note: Steps "Not Executed" and with No Result are not shown in this report. Detailed steps results LVV-R301-LVV-E3939 LVV-E3939-1459966442:

Note: Steps "Not Executed" and with No Result are not shown in this report.

A Documentation

The verification process is defined in LSE-160. The use of Docsteady to format Jira information in various test and planing documents is described in DMTN-140 and practical commands are given in DMTN-178.

B Acronyms used in this document

Acronym	Description
DMTN	DM Technical Note
LSE	LSST Systems Engineering (Document Handle)
LSR	LSST System Requirements; LSE-29
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
LVV	LSST Verification and Validation
OSS	Observatory System Specifications; LSE-30
PMCS	Project Management Controls System
PSE	Project Systems Engineering
RMS	Root-Mean-Square