



Vera C. Rubin Observatory
Software Test Report

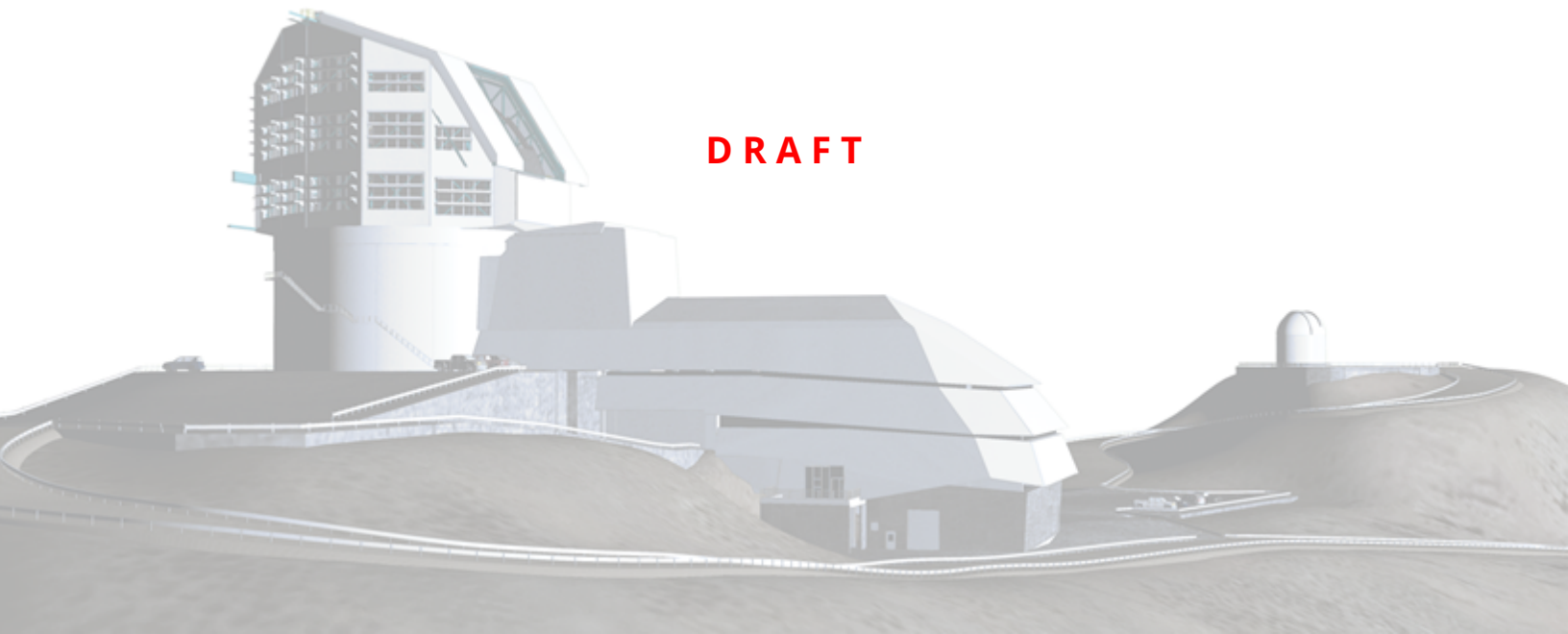
System-level Science Verification Acceptance Test Campaign: Instrument Signature Removal and Detector Characterization Test Plan

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SCTR-114

Latest Revision: 2025-01-31

DRAFT



Abstract

This is the test plan for **Instrument Signature Removal and Detector Characterization** (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 2025-01-31 . The most recent change to the document repository was on 2025-02-05.

Draft

Change Record

Version	Date	Description	Owner name
	2025-01-31	First draft	Christopher Waters

Document curator: Christopher Waters

Document source location: <https://github.com/lstt-dm/SCTR-114>

Version from source repository: 18ad257

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System-level Science Verification Acceptance Test Campaign: Instrument Signature Removal and Detector Characterization Test Plan

1 Introduction

1.1 Objectives

This acceptance test campaign will verify system-level science performance metrics in the OSS and LSR associated with instrument signature removal and detector characterization.

1.2 System Overview

None

1.3 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P136 Jira Test Plan and related Test Cycles (LVV-R299).

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 ?? provides detailed results for each step in each test case.

The current status of test plan LVV-P136 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://ls.st/LSE-160>, Vera C. Rubin Observatory LSE-160

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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-P136 owner:		Christopher Waters		
T. Cycle LVV-R299 owner:		Christopher Waters		
Test Cases	Assigned to	Executed by	Additional Test Personnel	
LW-E3897	Christopher Waters	Waters	Undefined	
LW-E3898	Christopher Waters	Waters	Undefined	TBD.
LW-E3899	Christopher Waters	Waters	Undefined	
LW-E3900	Christopher Waters	Waters	Undefined	
LW-E3901	Christopher Waters	Waters	Undefined	
LW-E3906	Yosuke Utsumi		Undefined	
LW-E3907	Yosuke Utsumi		Undefined	
LW-E3908	Yosuke Utsumi		Undefined	
LW-E3909	Yosuke Utsumi		Undefined	
LW-E3910	Yosuke Utsumi		Undefined	
LW-E3911	Yosuke Utsumi		Undefined	
LW-E3912	Yosuke Utsumi		Undefined	
LW-E3913	Yosuke Utsumi		Undefined	
LW-E3914	Yosuke Utsumi		Undefined	
LW-E3925	Yosuke Utsumi		Undefined	

4 Test Campaign Overview

4.1 Summary

T. Plan LVV-P136:	System-level Science Verification Acceptance Test Campaign: Instrument Signature Removal and Detector Characterization	Draft
T. Cycle LVV-R299:	System-level Science Verification Acceptance Test Campaign: Instrument Signature Removal and Detector Characterization (ComCam)	Not Executed
Test Cases	Ver.	
LVV-E3897	1.0(d)	
LVV-E3898	1.0(d)	
LVV-E3899	1.0(d)	
LVV-E3900	1.0(d)	
LVV-E3901	1.0(d)	
LVV-E3906	1.0(d)	
LVV-E3907	1.0(d)	
LVV-E3908	1.0(d)	
LVV-E3909	1.0(d)	
LVV-E3910	1.0(d)	
LVV-E3911	1.0(d)	
LVV-E3912	1.0(d)	
LVV-E3913	1.0(d)	
LVV-E3914	1.0(d)	
LVV-E3925	1.0(d)	

Table 2: Test Campaign Summary

4.2 Overall Assessment

None

4.3 Recommended Improvements

5 Detailed Tests

5.1 Test Cycle LVV-R299

Open test cycle *System-level Science Verification Acceptance Test Campaign: Instrument Signature Removal and Detector Characterization (ComCam)* in Jira.

Test Cycle name: System-level Science Verification Acceptance Test Campaign: Instrument Signature Removal and Detector Characterization (ComCam)

Status: Not Executed

Test campaign to support "System-level Science Verification Acceptance Test Campaign: Instrument Signature Removal and Detector Characterization" using ComCam.

5.1.1 Software Version/Baseline

Not provided.

5.1.2 Configuration

Not provided.

5.1.3 Test Cases in LVV-R299 Test Cycle

5.1.3.1 LVV-E3897 - Bias Image Pixel Noise Test

Version **1.0(d)**. Open *LVV-E3897* test case in Jira.

Measure read noise with bias images, using imaging pixels.

Preconditions:

Bias images collected. SuperBias image created. Gains for conversion from counts to electrons.

Final comment:

None

Detailed steps :

5.1.3.2 LVV-E3898 - Science Data Pixel Noise Test #1

Version **1.0(d)**. Open *LVV-E3898* test case in Jira.

To measure the per pixel noise on a selected science image. This test will calculate the noise by analyzing a science image and calculating the sigma in the image overscan region.

Preconditions:

An appropriate science image with a 15 second exposure must exist. Need Gains to convert from counts to electrons.

Final comment:

None

Detailed steps :

5.1.3.3 LVV-E3899 - Sky imaging test of cross-talk accuracy and stability

Version **1.0(d)**. Open *LVV-E3899* test case in Jira.

Quantify cross-talk accuracy and stability on sky images

Preconditions:

Nominal cross-talk correction matrix.

Final comment:

None

Detailed steps :

5.1.3.4 LVV-E3900 - Test cross-talk stability and accuracy for AP, DRP

Version **1.0(d)**. Open *LVV-E3900* test case in Jira.

verify stability and accuracy of cross-talk elements for AP and DRP production (if different)

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.5 LVV-E3901 - Crosstalk functionality exists

Version **1.0(d)**. Open *LVV-E3901* test case in Jira.

Verify that the crosstalk functionality exists in the alert production pipeline

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.6 LVV-E3906 - Usable Pixel Fraction

Version **1.0(d)**. Open *LVV-E3906* test case in Jira.

The maximum fraction of pixels scientifically unusable per sensor (out of the total allowable fraction of sensors meeting this performance) will not exceed PixFrac(1 percent). The maximum allowable fraction of sensors with fraction PixFrac unusable pixels will not exceed SensorFraction (15 percent)

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.7 LVV-E3907 - Single exposure dynamic range

Version **1.0(d)**. Open *LVV-E3907* test case in Jira.

Verify that objects within the specified dynamic range of a single image are not saturated

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.8 LVV-E3908 - Attenuation of gain variation of an hour

Version **1.0(d)**. Open *LVV-E3908* test case in Jira.

Verify the attenuation of errors due to gain variation over one hour time scales

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.9 LVV-E3909 - Attenuation of large scale gain variation errors

Version **1.0(d)**. Open *LVV-E3909* test case in Jira.

Verify the attenuation of errors due to gain variation

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.10 LVV-E3910 - Attenuation of small scale gain variation over short time scales

Version **1.0(d)**. Open *LW-E3910* test case in Jira.

Verify the attenuation of errors due to gain variation over short time scales

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.11 LVV-E3911 - Effect of gain on photometric repeatability -- 12 hours

Version **1.0(d)**. Open *LW-E3911* test case in Jira.

Verify effect of uncorrected gain variations on photometric repeatability on 12 hour time scales

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.12 LVV-E3912 - Effect of gain variations on photometric repeatability -- 1 hr

Version **1.0(d)**. Open *LW-E3912* test case in Jira.

Verify the effect of gain variations on photometric repeatability over 1 hour time scales

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.13 LVV-E3913 - Gain variation -- 1 hr

Version **1.0(d)**. Open *LVV-E3913* test case in Jira.

Verify amount of gain variation in one hour

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.14 LVV-E3914 - Crosstalk coefficient measurement capability

Version **1.0(d)**. Open *LVV-E3914* test case in Jira.

Verify that the LSST system is able to measure crosstalk coefficients during downtime

Preconditions:

None

Final comment:

None

Detailed steps :

5.1.3.15 LVV-E3925 - Amplifier Scale Sensor Gain Allocations

Version **1.0(d)**. Open *LVV-E3925* test case in Jira.

Verify the FPA sensor gain variation errors

Preconditions:

None

Final comment:

None

Detailed steps :

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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
AP	Alert Production
DMTN	DM Technical Note
DRP	Data Release Production
FPA	Focal Plane Array
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
TBD	To Be Defined (Determined)