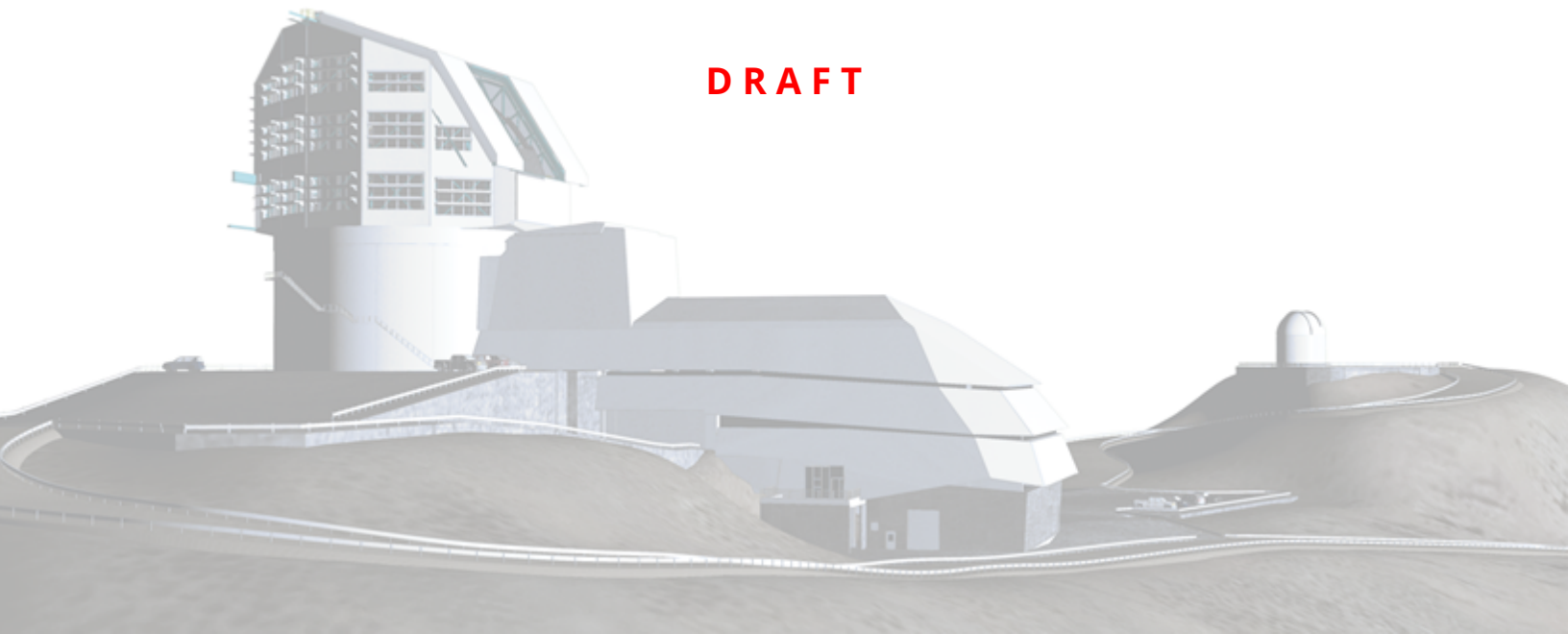**Vera C. Rubin Observatory**
Data Management

LDM-503-RSPa: RSP on the Interim Data Facility (IDF) is ready for DP0.2 Test Plan

Gregory Dubois-Felsmann

DMTR-381

Latest Revision: 2022-09-16

D R A F T

Abstract

This is the test plan for **RSP on the Interim Data Facility (IDF) is ready for DP0.2** (LDM-503-RSPa), an LSST milestone pertaining to the Data Management Subsystem. This document is based on content automatically extracted from the Jira test database on 2022-09-16 . The most recent change to the document repository was on 2022-09-16.

Change Record

Version	Date	Description	Owner name
pre-1.0	2022-09-16	Initial complete version of test plan	Gregory Dubois-Felsmann

Document curator: Gregory Dubois-Felsmann

Document source location: `https://github.com/lsst-dm/DMTR-381`

Version from source repository: 46179ce

Contents

LDM-503-RSPa: RSP on the Interim Data Facility (IDF) is ready for DP0.2 Test Plan

1 Introduction

1.1 Objectives

Demonstrate that the additional capabilities of the Rubin Science Platform necessary to support DP0.2 have been deployed on the Interim Data Facility (IDF). May be demonstrated with the DC2 DP0.2 dataset itself or with a dataset of equivalent complexity, e.g., an HSC reprocessing.

DP0.2 expectations are as described in RTN-001 and RTN-004 . The key difference in RSP capabilities from DP0.1 is the availability of IVOA-compatible image metadata services and image services in the API Aspect, and the addition to the Portal Aspect of specific search capabilities for ObsCore image metadata searches in an ObsTAP service.

Because of issues with passing authorization tokens through PyVO, for the purposes of LDM-503-RSPa the API Aspect services are verified indirectly, though the Portal Aspect.

A supplementary verification of their usability through the Notebook Aspect and externally will have to be performed. See LVV-T2678.

1.2 System Overview

1.3 Document Overview

This document was generated from Jira, obtaining the relevant information from the LVV-P80 Jira Test Plan and related Test Cycles (LVV-C167).

Section 1 provides an overview of the test campaign, the system under test (LSP Services), the

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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-P80 in Jira is **Approved** .

1.4 References

[1] **[DMTN-140]**, Comoretto, G., 2021, *Documentation Automation for the Verification and Validation of Rubin Observatory Software*, DMTN-140, URL `https://dmtn-140.lsst.io/`, Vera C. Rubin Observatory Data Management Technical Note

[2] **[DMTN-178]**, Comoretto, G., 2021, *Docsteady Usecases for Rubin Observatory Constructions*, DMTN-178, URL `https://dmtn-178.lsst.io/`, Vera C. Rubin Observatory Data Management Technical Note

[3] **[LSE-160]**, Selvy, B., 2013, *Verification and Validation Process*, LSE-160, URL `https://ls.st/LSE-160`

2   Test Plan Details

2.1   Data Collection

Observing is not required for this test campaign.

2.2   Verification Environment

Must be executed in a well-documented controlled state of the IDF.

2.3   Related Documentation

2.4   PMCS Activity

Primavera milestones related to the test campaign:

- LDM-503-RSPa

3 Personnel

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

	T. Plan LVV-P80 owner:	**Gregory Dubois-Felsmann**	
	T. Cycle LVV-C167 owner:	**Gregory Dubois-Felsmann**	
Test Cases	**Assigned to**	**Executed by**	**Additional Test Personnel**
LVV-T2677	Gregory Dubois-Felsmann	Gregory Dubois-Felsmann	
LVV-T2721	Gregory Dubois-Felsmann		
LVV-T707	Jeffrey Carlin		
LVV-T2716	Gregory Dubois-Felsmann		

4   Test Campaign Overview

4.1   Summary

T. Plan LVV-P80:	**LDM-503-RSPa: RSP on the Interim Data Facility (IDF) is ready for DP0.2**	Approved
T. Cycle LVV-C167:	**LDM-503-RSPa: Test RSP capabilities on IDF for DP0.2 readiness**	Not Executed
Test Cases	**Ver.**	
LVV-T2677	1	
LVV-T2721	1	
LVV-T707	1	
LVV-T2716	1	

Table 2: Test Campaign Summary

4.2   Overall Assessment

Not yet available.

4.3   Recommended Improvements

5   Detailed Tests

5.1   Test Cycle LVV-C167

Open test cycle *LDM-503-RSPa: Test RSP capabilities on IDF for DP0.2 readiness* in Jira.

Test Cycle name: LDM-503-RSPa: Test RSP capabilities on IDF for DP0.2 readiness
Status: Not Executed

This test cycle contains the tests necessary to verify the readiness of the RSP as redeployed on the IDF to meet the needs of the DP0.2 exercise, essentially repeating tests previously carried out on the NCSA RSP deployments. This test cycle builds on LVV-C166, including only the test cases necessary to verify additional capabilities needed for DP0.2, essentially all associated with image and image metadata searches in the API and Portal Aspects.

5.1.1   Software Version/Baseline

Not provided.

5.1.2   Configuration

Not provided.

5.1.3   Test Cases in LVV-C167 Test Cycle

5.1.3.1   LVV-T2677 - LDM-503-RSPa: Portal Aspect tests for DP0.2 readiness - single-epoch images

Version **1**. Open *LW-T2677* test case in Jira.

Verify that the subset of RSP Portal capabilities planned to be added for DP0.2 are present, based on single-epoch images.

 Preconditions:

Final comment:

Detailed steps :

Step 1 — Description

Navigate to the Portal Aspect endpoint. The stable version of the RSP at the interim data facility (IDF) should be used for this test and is currently located at: `https://data.lsst.cloud/`. The Portal Aspect can be reached by clicking on "Portal" in the RSP home page or by navigating directly to `https://data.lsst.cloud/portal/app`.

Expected Result

A credential-entry screen should be displayed.

Step 2 — Description

Enter a valid set of credentials for an LSST user with RSP access on the instance under test.

Expected Result

The Portal Aspect UI should be displayed following authentication.

Step 3 — Description

Within the Portal Aspect UI, navigate, if necessary, to the "RSP Tap Search" screen, using the "blue button" at the top left of the Portal Aspect UI.

Expected Result

A screen titled "TAP Searches" is displayed.

Step 4 — Description

Ensure that the RSP instance's own TAP service is selected in Section 1 of the screen.

Expected Result

The "Select TAP Service" menu should be displaying "Using LSST RSP".

Step 5 — Description

Select "Image Search (ObsTAP)" in Section 2 of the screen.

— —

Expected Result

The screen should change to show "(Searching the ivoa.ObsCore table on this service…)" in Section 2 and to display a Section 3 beginning with an "Observation Type and Source" selector.

Step 6   Description

If a calibration level (or levels) is/are specified for this test, here: 2
ensure that the "Observation Type and Source" checkbox is selected, and then check off the specified calibration level(s). Otherwise, ensure that no calibration level is checked.

— —

Expected Result

Step 7   Description

Starting from the ObsTAP search screen, ensure that "Location" search is selected (using the checkbox), and that the disclosure triangle for its search specification is opened (i.e., pointing down).
Ensure that the query type "Observation boundary contains point" is selected. Enter the target coordinates 62.0, -37.0 in the "Coordinates or object name" field. Type <TAB> or otherwise leave the entry field.

— —

Expected Result

The "Coordinates of object name" field should not show an error (i.e., should not be highlighted in red).

Step 8   Description

Execute the search. Note the number of images returned.

— —

Expected Result

Following the execution of the search, the Portal Aspect should display, in its standard table viewer, a list of single-epoch Processed Visit Images (PVIs), identified by a "dataproduct_subtype" of "lsst.calexp" (a string derived directly from the Butler dataset type of the images).

On the upper left there will be a pane with two tabs: "Coverage", which should display the outline of the images on the sky, and "Data Product", which should display the currently selected image in the table.

On the upper right, there will be an x-y plot of the central RA and Dec of each of the images.

Step 9	Description

Verify that the result table contains information on the filter band, both as the custom column "lsst-band" and as the ObsCore-standard columns "em_min" and "em_max". Verify that it is possible to narrow the selection by filter band using the table viewer's filtering tools.

Expected Result

Step 10	Description

Verify that the result table contains information on the time at which the exposure was taken, via the ObsCore "t_min" and "t_max" columns, which display MJD values. Verify that the selection of images can be filtered with these values (e.g., with column-header filter expressions such as ">60350", corresponding to dates after 2024-02-10), as well as sorted.

Expected Result
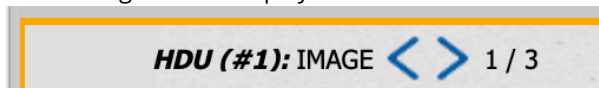
Step 11	Description

Verify that clicking on rows in the table, points in the scatter plot, and frames in the coverage image all serve to change the currently displayed image and are reflected in all the panes in a coordinated way.

Expected Result

The "linking" behavior normal to Portal Aspect results displays should be seen to apply equally well to image search results.

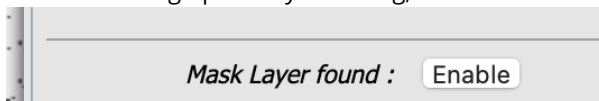| Step 12	Description

For one of the selected images, verify, by using the select-extension controls, that the mask and variance planes of the image can be displayed.

Use the "image layers" toolbar button

to bring up the layers dialog, and enable the overlay of mask data:

Use the resulting dialog to request the overlay of one or more individual mask planes.

Note that the mask plane colors and transparency may be edited, and that the mask layer dialog also highlights the mask status of the pixel currently at the mouse position.

— —

Expected Result

| Step 13 | Description |

Dismiss the results of the previous search, by clicking on the "x" in the "tab" atop the results table.

 Image Search Results Table

— —

Expected Result

| Step 14 | Description |

If a calibration level is specified for this test, here: (none)
ensure that the "Observation Type and Source" checkbox is selected, and then check off the specified calibration level. Otherwise, ensure that no calibration level is checked.

— —

Expected Result

| Step 15 | Description |

Starting from the ObsTAP search screen, ensure that "Location" search is unselected (using the checkbox). Ensure that "Timing" searches are selected and that the disclosure triangle for their search specification is opened (i.e., pointing down).

The specified time or time range for this search is: 2024-10-01 00:00Z through 2024-11-01 00:00Z

Depending on the above value, select the appropriate "Time of Observation" menu item: "Completed in the last …" for a relative time-since specification, or "Overlapping specified range" for an absolute-time range. For the latter, select "UTC date/times (ISO format)" or "MJD" as appropriate to the way the specification appears above. Type <TAB> or otherwise leave the entry field.

— —

Expected Result

The data entry fields in the "Timing" section of the screen should not show any error (i.e., should not be highlighted in red).

Step 16   Description

Limit the search to a specific detector: in the right-hand side of the ObsTAP interface, enter the text below in order to do this. Then execute the search. (NB: detector 94 happens to be the central CCD in the array.)

Test Data

=94

Expected Result

The result should be a table of observations for the specified date range and the specified detector. Because no calibration level restriction was applied, the search result should include multiple image types.

Step 17   Description

Verify by inspecting the dataproduct_subtype column of the search result that raw (lsst.raw), PVI (lsst.calexp), and difference images (lsst.goodSeeingDiff_differenceExp) are available. Verify by clicking on rows of each type that each type of image can be displayed. Note in particular that raw images have a different format (16 single-amplifier images).

Expected Result

Step 18   Description

Using the ability to sort the image metadata table by the "t_min" column, select the earliest "lsst.calexp" image for the selected detector in the query result.

Record, for concreteness, the t_min, lsst_band, lsst_visit, lsst_detector, and obs_id for this row in the table.

In the single-image display ("Data Product" tab) for this image, click on the "Pin Image" button. This saves the image for further inspection. This is not actually a pre-requisite for the actions that follow, but simplifies the test conditions, for concreteness.

Expected Result

Step 19	Description

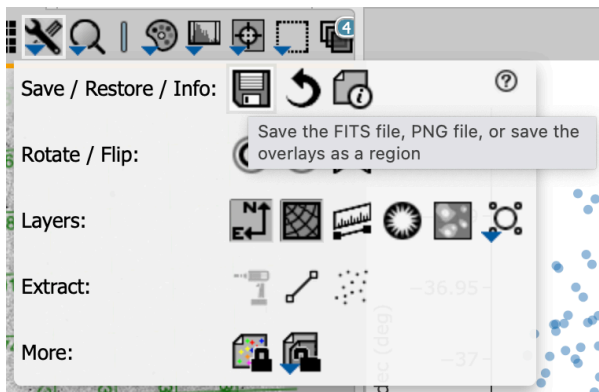Dismiss the results of the ObsTAP search, by clicking on the "x" in the "tab" atop the results table.

Image Search Results Table

Expected Result

This should leave only the previously "pinned" image being displayed.

Step 20	Description

Use the "diskette" button in the image toolbar to "Save"/download the image to a local FITS file.

Expected Result

A FITS file should be visible in the browser's download list.
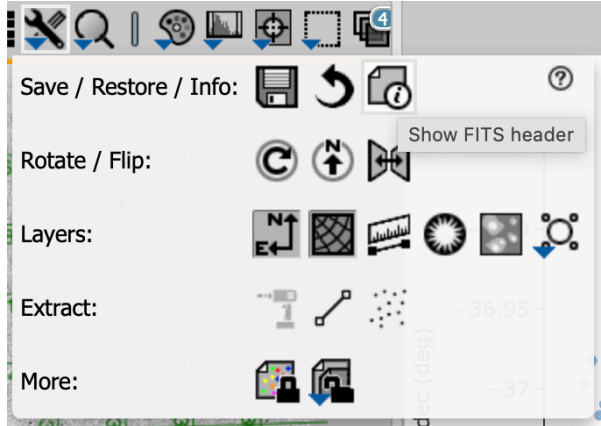
Step 21	Description

Use a non-Rubin tool to confirm that the file is in FITS format. Report the tool used and any validation errors obtained - however, note that Rubin does use some extensions and that the validation is not required to be completely "clean".

A later version of this test will be more explicit about what tool to use and what is an acceptable deviation.

Expected Result

| Step 22 | Description |

Use the "Info" button in the image toolbar to display the FITS headers.

- -

Expected Result

| Step 23 | Description |

Click on the coordinate display name in the lower left of the image pane. (This will likely initially say "EQ-J2000".) Record all coordinate systems offered for the readout. Select "Equatorial J2000 decimal". Note that "0-based pixel" readout in fact respects the LSST "XY0" convention, when present in the data, and will correctly display offset coordinates, as for a patch within a tract.

Click on the "Show expanded readout …" button in the lower left. Configure the resulting display to show both astrophysical and 0-based pixel coordinates.

Mouse around in the image to explore the results.

- -

Expected Result

| Step 24 | Description |

Click on "lock by click" and observe that the mode changes from follow-mouse to retaining coordinate values for a selected point in the image.

Use the provided copy-to-clipboard function

and record the resulting clipboard text.

— —
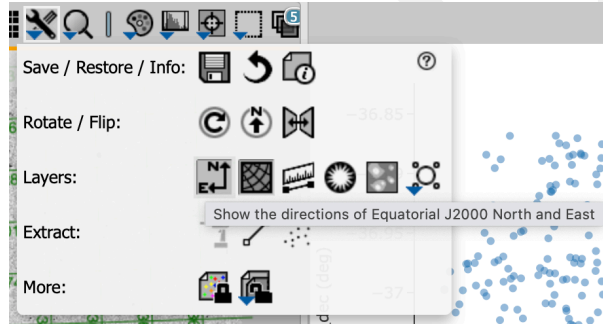
Expected Result

Step 25	Description

Confirm that, when the mouse is not rapidly moving, the pixel value is displayed along with the coordinates.

— —
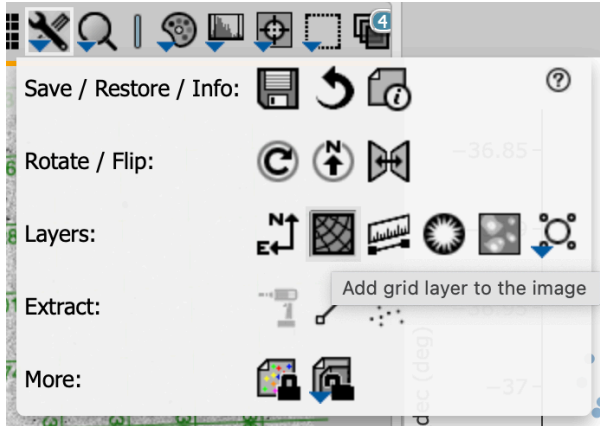
Expected Result

Step 26	Description

Using the corresponding image toolbar buttons, confirm that a "compass" (with the appropriate handedness) and a coordinate grid overlay are available.

Compass:

Grid:

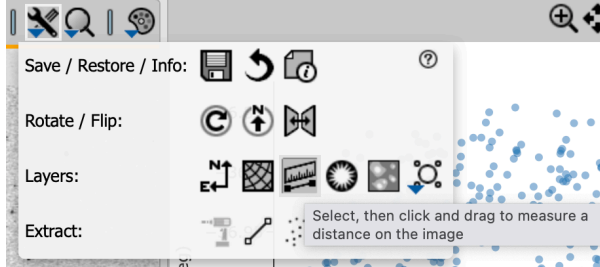With the grid displayed, use the layer-control dialog

to explore the different coordinate systems available, and record them.

Then remove these overlays (using "delete" actions in the layer-control dialog) to avoid clutter in following steps.

— —

Expected Result

Step 27	Description

Activate the distance-measurement tool using its image toolbar button.

Verify that it functions with both pixel and astrophysical distances and gives plausible results. Use the layer-control dialog to explore the ability to change the units of measurement.

For this test it is not necessary to validate the distance calculation in detail. A separate test case will perform a detailed comparison of an afw-based measurement and a Portal measurement (see DM-36236).
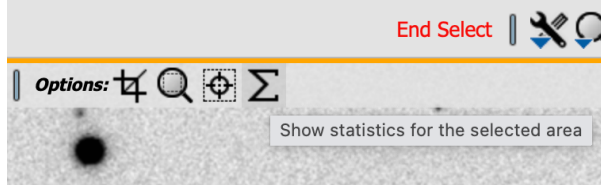
Again, to avoid clutter, use the layer-control dialog to dismiss the distance-measurement tool.

— —

Expected Result

| Step 28 | Description |

Use the "rectangular selection" tool to choose a subregion of the displayed image.
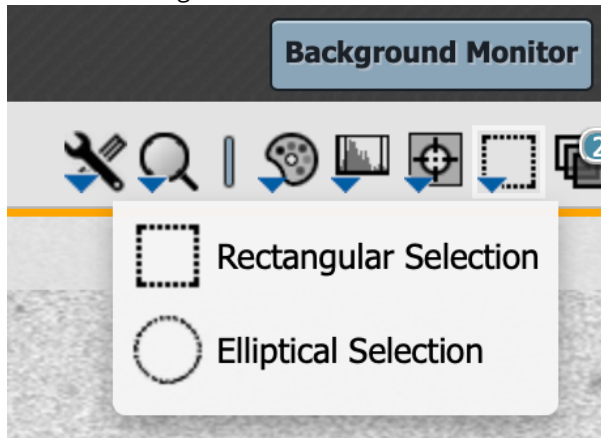
Use the "statistics" button which appears in the image toolbar to bring up an image-statistics dialog.

Record a screenshot of the dialog and comment on the functionality compared to the requirement.

Note that hovering over the reported positions in the dialog results in their being highlighted on the image.

Expected Result

| Step 29 | Description |

Use the image manipulation entries on the toolbar to modify the image display. Comment on the behavior.

Use the "Save" button to confirm that it is possible to save a snapshot of the current state as a PNG. Use this to document some samples of the behavior.

It is not necessary to validate the actual stretch algorithms in this test case, but a future test case should address this.

Expected Result

Step 30   Description

Confirm that it is possible to pan, zoom, and rotate an image, and to save-as-PNG to save the results.

Expected Result

Step 31   Description

Close the Portal window and open a new one. Re-authentication should not be necessary unless using a private window.

Again, this is not required but keeps the test conditions from accumulating residue of previous steps.

Expected Result

Step 32   Description

If a calibration level is specified for this test, here: 2
ensure that the "Observation Type and Source" checkbox is selected, and then check off the specified calibration level. Otherwise, ensure that no calibration level is checked.

Expected Result

Step 33   Description

Ensure that the "Location" and "Timing" selectors on the ObsTAP screen are unchecked. (These will be implicit in the Visit ID.)

Expected Result

Step 34   Description

Enter the Visit ID, 538450 , as a constraint on the "lsst_visit" field in the constraints table on the right side of the

UI, as "= 538450 ".

Expected Result

| Step 35 | Description |

Execute the search.

Expected Result
The usual Portal "tri-view" should appear, with a table of all the CCD-level images in the selected visit in the bottom half of the display, coverage map and single-image-display tabs in the upper left, and an X-Y plot in the upper right.

| Step 36 | Description |

Verify that clicking on rows in the table, image frames in the coverage plot, and points in the X-Y plot all take effect across all three views, and change which image is actually displayed.

Expected Result

| Step 37 | Description |

Verify that the coverage image displays the expected pattern of CCDs in the focal plane for a single visit, projected on the sky.

Expected Result

| Step 38 | Description |

Verify that the correct visit was returned.

Expected Result

| Step 39 | Description |

This step confirms that the image search was done via an ADQL (ObsTAP) search in the Portal Aspect.

Click on the "(i)" button in the image metadata table toolbar. From the resulting dialog, record the "Job Link", using the copy-to-clipboard button provided. Note that it is under the API-Aspect endpoint of the RSP instance under test.

Click on the "Job Link" URL in the dialog. A browser window containing the XML job definition will appear. Save the XML and attach it to this test. Extract the ADQL text from the '<uws:parameter id="QUERY">' element in the XML and record it.

— —

Expected Result

Step 40   Description

Use the "RSP TAP Search" screen to perform a search on the dp02_dc2_catalogs.Visit table for visit 538450 :

1. Unselect both the "Spatial" and "Temporal" constraint tools on the left side of section 4, "Enter Constraints".
2. On the right side, enter "= 538450 " in the "Constraints" field in the table for the "visit" attribute.
3. Execute the search.

Record the number of rows returned and describe the data.

— —

Expected Result
A single-row table should be returned with high-level metadata for the full visit.

Step 41   Description

Use the "RSP TAP Search" screen to perform a search on the dp02_dc2_catalogs.CcdVisit table for visit 538450 :

1. Unselect both the "Spatial" and "Temporal" constraint tools on the left side of section 4, "Enter Constraints".
2. On the right side, enter "= 538450 " in the "Constraints" field in the table for the "visitId" attribute.
3. Execute the search.

Record the number of rows returned and describe the data.

Note whether the observation time varies per-CCD as it should for real data. However, that is not germane to the test-passing criteria; it is a Science Pipelines issue.

— —

Expected Result

A 189-row table should be returned with per-CCD metadata on the result of the data processing.

5.1.3.2 LVV-T2721 - LDM-503-RSPa: Portal Aspect tests for DP0.2 readiness - coadded images

Version **1**. Open *LVV-T2721*   test case in Jira.

Verify that the subset of RSP Portal capabilities planned to be added for DP0.2 are present, as pertaining to coadded images

 Preconditions:

Final comment:

Detailed steps :

| Step 1 | Description |

Navigate to the Portal Aspect endpoint.   The stable version of the RSP at the interim data facility (IDF) should be used for this test and is currently located at: `https://data.lsst.cloud/`. The Portal Aspect can be reached by clicking on "Portal" in the RSP home page or by navigating directly to `https://data.lsst.cloud/portal/app`.

Expected Result

A credential-entry screen should be displayed.

| Step 2 | Description |

Enter a valid set of credentials for an LSST user with RSP access on the instance under test.

Expected Result

The Portal Aspect UI should be displayed following authentication.

| Step 3 | Description |

Within the Portal Aspect UI, navigate, if necessary, to the "RSP Tap Search" screen, using the "blue button" at the top left of the Portal Aspect UI.

— —

Expected Result
A screen titled "TAP Searches" is displayed.

Step 4   Description
Ensure that the RSP instance's own TAP service is selected in Section 1 of the screen.

— —

Expected Result
The "Select TAP Service" menu should be displaying "Using LSST RSP".

Step 5   Description
Select "Image Search (ObsTAP)" in Section 2 of the screen.

— —

Expected Result
The screen should change to show "(Searching the ivoa.ObsCore table on this service...)" in Section 2 and to display a Section 3 beginning with an "Observation Type and Source" selector.

Step 6   Description
If a calibration level (or levels) is/are specified for this test, here: 3
ensure that the "Observation Type and Source" checkbox is selected, and then check off the specified calibration level(s). Otherwise, ensure that no calibration level is checked.

— —

Expected Result

Step 7   Description
Starting from the ObsTAP search screen, ensure that "Location" search is selected (using the checkbox), and that the disclosure triangle for its search specification is opened (i.e., pointing down).
Ensure that the query type "Observation boundary contains point" is selected. Enter the target coordinates 62.0, -37.0 in the "Coordinates or object name" field. Type <TAB> or otherwise leave the entry field.

— —

Expected Result
The "Coordinates of object name" field should not show an error (i.e., should not be highlighted in red).

| Step 8 | Description |

Observe and report on the absence of an obvious way to say "I only want to see coadds". This is a known weakness of relying on the ObsCore data model exclusively; there's no unambiguous way in ObsCore to express such a limitation on a search.

Calibration level 3, chosen above, selects derived images, but unfortunately for this purpose that includes both single-epoch difference images and multi-epoch coadds.

It would be possible to select on t_exptime, to ask for effective exposure times (much) longer than the single-epoch norm of 30 seconds, but unfortunately at this time the pipelines don't report even an approximate exposure time for coadds.

A forthcoming version of the Portal will be pre-configured with a pick list of the available image types, which will address this need, but in the mean time, the next test step provides a workaround.

(This test case will be updated once it is available.)

— —

Expected Result

| Step 9 | Description |

Use the constraints table on the right of the search screen to add the constraint ">0" to the "lsst_tract" field. This requires the images selected by the search to have an assigned location in the coadded skymap, effectively selecting coadds.

As noted above, this is a workaround and is not the intended final UX.

— —

Expected Result

| Step 10 | Description |

Execute the search. Note the number of images returned. Note the values of "dataproduct_subtype" returned.

— —

Expected Result

Following the execution of the search, the Portal Aspect should display, in its standard table viewer, a list of 24 coadded images: from two coadd "patches" that both happen to overlap the specified target, from two types of coadds - "deep" and "good seeing", identified by "dataproduct_subtype" values of "lsst.deepCoadd_calexp" and "lsst.goodSeeingCoadd", respectively (strings derived directly from the Butler dataset type of the images) - and from six filters; 2*2*6 = 24.

On the upper left there will be a pane with two tabs: "Coverage", which should display the outline of the images on the sky, and "Data Product", which should display the currently selected image in the table.

On the upper right, there will be an x-y plot of the central RA and Dec of each of the images.

Step 11 Description

Verify that the result table contains information on the filter band, both as the custom column "lsst-band" and as the ObsCore-standard columns "em_min" and "em_max". Verify that it is possible to narrow the selection by filter band using the table viewer's filtering tools.

— —

Expected Result
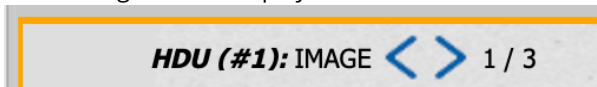
Step 12 Description

Verify that clicking on rows in the table, points in the scatter plot, and frames in the coverage image all serve to change the currently displayed image and are reflected in all the panes in a coordinated way.

— —

Expected Result

The "linking" behavior normal to Portal Aspect results displays should be seen to apply equally well to image search results.
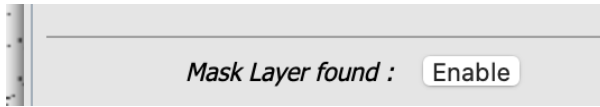
Step 13 Description

For one of the selected images, verify, by using the select-extension controls, that the mask and variance planes of the image can be displayed.

Use the "image layers" toolbar button

to bring up the layers dialog, and enable the overlay of mask data:

Use the resulting dialog to request the overlay of one or more individual mask planes.

Note that the mask plane colors and transparency may be edited, and that the mask layer dialog also highlights the mask status of the pixel currently at the mouse position.

— —

Expected Result

Step 14	Description

Dismiss the results of the previous search, by clicking on the "x" in the "tab" atop the results table.

Image Search Results Table

— —
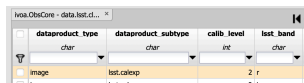
Expected Result

5.1.3.3   LVV-T707 - Verify multi-image scaling and alignment

Version **1**. Open *LVV-T707*   test case in Jira.

Verify that the Portal has the capability to display multiple images on a common astrophysical coordinate scale, aligned on the screen in a common orientation.

 Preconditions:

Final comment:

Detailed steps :

Step 1   Description

Navigate to the Portal Aspect endpoint.   The stable version of the RSP at the interim data facility (IDF) should be used for this test and is currently located at: `https://data.lsst.cloud/`. The Portal Aspect can be reached by clicking on "Portal" in the RSP home page or by navigating directly to `https://data.lsst.cloud/portal/app`.

Expected Result

A credential-entry screen should be displayed.

Step 2   Description

Enter a valid set of credentials for an LSST user with RSP access on the instance under test.

Expected Result

The Portal Aspect UI should be displayed following authentication.

Step 3   Description

If a calibration level (or levels) is/are specified for this test, here: 2, 3
ensure that the "Observation Type and Source" checkbox is selected, and then check off the specified calibration level(s). Otherwise, ensure that no calibration level is checked.

Expected Result

Step 4   Description

Starting from the ObsTAP search screen, ensure that "Location" search is selected (using the checkbox), and that the disclosure triangle for its search specification is opened (i.e., pointing down).
Ensure that the query type "Observation boundary contains point" is selected. Enter the target coordinates 60.361, -34.980 in the "Coordinates or object name" field. Type <TAB> or otherwise leave the entry field.

Expected Result

The "Coordinates of object name" field should not show an error (i.e., should not be highlighted in red).
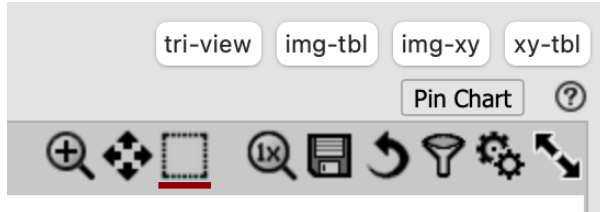
Step 5   Description

Use the "Spectral Coverage" section of the "3. Enter Constraints" field on the left to restrict coverage to images covering 600 nanometers .

(This selects the r-band. Symbolic selection of this will be available in a subsequent release of the Portal Aspect.)

Expected Result

Step 6 · Description

Execute the search. The usual "tri-view" should appear. Use the "img-tbl" button on the upper right to change to a mode without the x-y plot viewer, which is not particularly useful for this test.

Expected Result

The image table should appear on the right, with the image ("Data Product") viewer and the coverage image in tabs on the left. Only r-band images should be shown.

Step 7 · Description

Select the coverage image tab.

Expected Result

The coverage tab should display the frames of all the images returned from the search.

Step 8 · Description

Use the layers dialog, from the "Manipulate overlay display" button in the image toolbar:

to change the display of image frames from "all" to "selected". (This shows only the frames of images that are selected using the checkbox in their table row.)
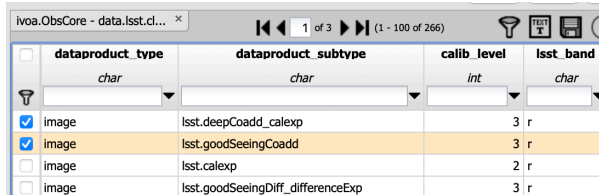
– –
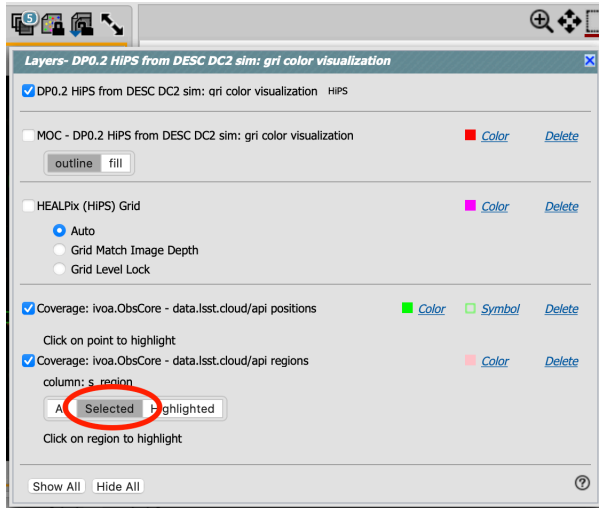
Expected Result

| Step 9 | Description |

Click on the header of the "t_min" column to sort the data in increasing order of time.

– –

Expected Result

Two coadded images, one "deep" (dataproduct_subtype = lsst.deepCoadd_calexp) and one "good seeing" (lsst.goodSeeingCoadd), of the same sky tile, should appear at the top of the list (NB: coadded images do not have times assigned in the DP0.2 dataset; this will be changed in later data releases).

| Step 10 | Description |

Use the checkboxes to select the two coadded images at the top of the list.

– –

Expected Result

Their (identical) frames should appear in the coverage image.

| Step 11 | Description |

Look down in the list to the two single-epoch CCD images (a coadd and a difference image) from visit 193110 (see the "lsst_visit" column). These should be the 7th and 8th in the table. Use the checkboxes to select these.

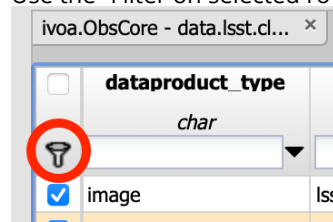(This visit is chosen for this test case because it's at a distinctive angle to the coadd tiles.)

Zoom the coverage display so that it clearly displays the frames of both the coadds and the single-epoch images.

— —

Expected Result

There should now be four images selected.

Step 12   Description

Use the "Filter on selected rows" control in the table header

to limit the display to only the selected images.

— —

Expected Result

Only the four selected images should remain in the table.

Step 13   Description

Select the "Data Product" tab. Use the "Show full grid" control in the image toolbar
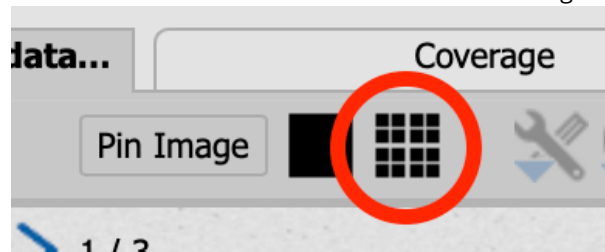
to show all four images at once.

— —

Expected Result

The images should be displayed in a 2x2 grid.

One image will be highlighted with a yellow/orange border, following the highlighted row in the table.

(Note that the image display itself does not clearly indicate which image is which; this is a known deficiency and will be addressed by future changes to the back-end image services and the Portal. In the mean time, the image metadata table highlight can be used to explore which is which.)

_____
  Step 14   Description

If the test started in a fresh session, the images will normally be initially displayed each in its own natural row/column orientation.

Highlight one of the coadded images in the table. Then select the "Align and lock by WCS" control in the image toolbar.

— —
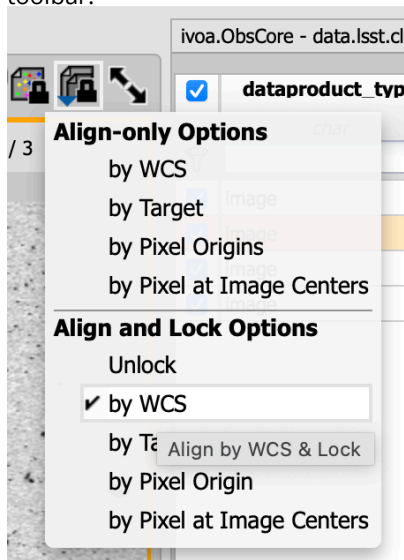
Expected Result

All four images should now be displayed at the same orientation and scale. Note that the Visit-193110 images appear significantly rotated.

_____
  Step 15   Description

Zoom and pan on the images to verify that they move together.

Enjoy the comparison of the single-epoch and coadded image depths, and the comparison of the single-epoch image and the difference image. (Note: in the DP0.2 production, the "good seeing" coadd was used as the template image for the image differencing.)

— —

Expected Result

5.1.3.4   LVV-T2716 - LDM-503-RSPa: Test HiPS functionality in DP0.2

Version **1**. Open *LVV-T2716*   test case in Jira.

Verify DM and RSP requirements on the availability of Rubin-created HiPS imaging, within the context of DP0.2.

 Preconditions:

Final comment:

Detailed steps :

Step 1   Description

Navigate to the Portal Aspect endpoint.   The stable version of the RSP at the interim data facility (IDF) should be used for this test and is currently located at: `https://data.lsst.cloud/`. The Portal Aspect can be reached by clicking on "Portal" in the RSP home page or by navigating directly to `https://data.lsst.cloud/portal/app`.

Expected Result

A credential-entry screen should be displayed.

Step 2   Description

Enter a valid set of credentials for an LSST user with RSP access on the instance under test.

Expected Result

The Portal Aspect UI should be displayed following authentication.

Step 3   Description

Navigate to the "External Images" tab of the interface. This is a temporary workaround - a more obvious path for this will be provided in a future version of the Portal Aspect application.

— —

Expected Result

_____
  Step 4   Description

In "1. Choose Image Type" select "View HiPS Images". Leave "2. Select Image Source" and "3. Select Target" at their defaults ("Search", and empty data-entry fields, respectively).

Record the HiPS images that are displayed in the resulting pick list.

— —

Expected Result

In "4. Select Data Set" a checkbox "Rubin Featured" should be checked, and a list of seven or eight HiPS images from DP0.2 should be displayed: six single-band images and one or more three-color images.

_____
  Step 5   Description

Click on the "(i)" icon in one of the rows. Note the display of a HiPS "properties" file in a new window. Record the full URL for this window. Then close the window.

Verify that the URL begins with "https:".

Verify that the URL cannot be opened successfully in a private browser window. Record the error indication received.

— —

Expected Result

E.g., "https://data.lsst.cloud/api/hips/images/band_u/properties".

_____
  Step 6   Description

Select one of the HiPS images in the displayed table, and record the selected map and its displayed pixel scale.

Click on the "Search" button in the lower left of the UI. Record the time required to put up an initial display of the image.

— —

Expected Result

The HiPS image should be displayed.

| Step 7 | Description |

Verify that the UI permits panning and zooming on the image. Note the limited coverage (roughly 300 sq. deg., less than 1% of the sky) of the map, so this is not a full test of the performance of these functions at a zoomed-out scale.
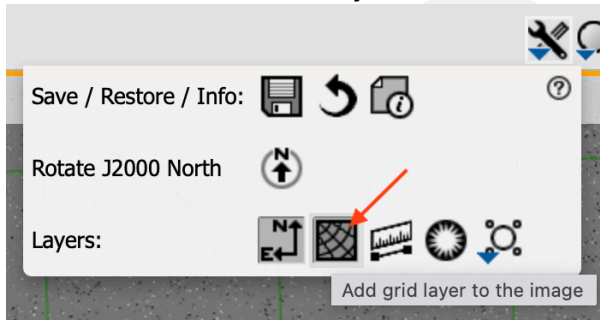
Expected Result

| Step 8 | Description |

Verify that coordinate readouts are available for the mouse position on the HiPS image. Record the available coordinate systems.

Expected Result

| Step 9 | Description |

Add the coordinate-lines overlay with the usual toolbar button:

Verify that the display accords roughly with the standard Portal Aspect coordinate readout. Then use the layers dialog

to delete the grid overlay.

Expected Result

| Step 10 | Description |

If the selected HiPS image was the "gri color" one, change to one of the single-band ones. Ensure that it behaves similarly. Leave it selected.

‒ ‒

Expected Result

Step 11   Description

Navigate to the "RSP TAP Search" screen in the Portal. Select the "Single Table" query type.

‒ ‒

Expected Result

Step 12   Description

Select the " dp02_dc2_catalogs " table collection/schema and the " Object " table.

‒ ‒

Expected Result

Step 13   Description

Verify that queries in Galactic and Ecliptic coordinate systems are possible:

1. Enter a search radius of 0.02 degrees.
2. Enter the target coordinates "239.143686, -47.681348 gal" (Galactic). Use the "Populate and edit ADQL" button at the bottom of the screen to inspect the resulting ADQL for the CIRCLE construct, which should be in ICRS degrees. Verify that it is close to (62.0, -37.0) in those units. Return to the "Single Table" search screen.
3. Enter the target coordinates "47.388563, -56.371758 ecl" (ecliptic). Use the "Populate and edit ADQL" button at the bottom of the screen to inspect the resulting ADQL for the CIRCLE construct, which should be in ICRS degrees. Verify that it is close to (62.0, -37.0) in those units. Return to the "Single Table" search screen.

‒ ‒

Expected Result
E.g., CIRCLE('ICRS', 61.9999155538758, -36.99994564119228, 0.02)

Step 14   Description

Confirm that the specified Table Collection and Table are still selected.   Ensure that the "Spatial" section of the constraints-builder on the left of Section 4 is selected (checked) and its disclosure triangle is open.   Ensure that the query type "Cone" is chosen.   Ensure that the "Temporal" section is unchecked.

Expected Result

| Step 15 | Description |

Enter the search target coordinates: 62, -37 .
Enter the search radius: 0.02 degrees degrees.

Expected Result

| Step 16 | Description |

Execute the query.

Expected Result

The results of the catalog query should be displayed in the standard Portal Aspect "tri-view", with an overlay on the previously selected HiPS image. Note that the "coverage" image used (which should be visible in a separate tab inside the interface) is also a HiPS image. It should be the "gri color" image (which is why an above step suggested not using "gri color" for the selected image - so that they could be more clearly distinguished).

| Step 17 | Description |

Click the "logout" button at the upper right corner of the Portal screen.

Expected Result

Returned to the RSP home page at https://data.lsst.cloud/. When navigating to the portal endpoint, expect to execute the steps in LVV-T849.

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
ADQL	Astronomical Data Query Language
API	Application Programming Interface
CCD	Charge-Coupled Device
DC2	Data Challenge 2 (DESC)
DM	Data Management
DMTN	DM Technical Note
DP0	Data Preview 0
FITS	Flexible Image Transport System
HSC	Hyper Suprime-Cam
IDF	Interim Data Facility
ISO	International Standards Organisation
IVOA	International Virtual-Observatory Alliance
LDM	LSST Data Management (Document Handle)
LSE	LSST Systems Engineering (Document Handle)
LSST	Legacy Survey of Space and Time (formerly Large Synoptic Survey Telescope)
LVV	LSST Verification and Validation
MJD	Modified Julian Date (to be avoided; see also JD)
NCSA	National Center for Supercomputing Applications
PMCS	Project Management Controls System
PNG	Portable Network Graphics
PVI	Processed Visit Image
RA	Right Ascension
RSP	Rubin Science Platform
RTN	Rubin Technical Note

TAP	Table Access Protocol
UI	User Interface
URL	Universal Resource Locator
UTC	Coordinated Universal Time
UX	User Experience
WCS	World Coordinate System
XML	eXtensible Markup Language
deg	degree; unit of angle