



SUBJECT: HCSS 1.0.3 DP-SPIRE Acceptance Test Report

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 The SPIRE logo features a stylized blue swirl with a starburst at its center, followed by the word "SPIRE" in a bold, black, sans-serif font.	HCSS 1.0.3 DP- SPIRE Acceptance Testing	Doc.	SPIRE-DOC-003235
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1. Introduction

1.1 Purpose of document

The purpose of this document is to report on the execution of the SPIRE pipeline scripts and tools as provided in the SPIRE version of the HCSS 1.0.3 software release.

1.2 Documents

1.2.1 Applicable Documents

Document Name	Document Number	Version Number
SPIRE Data Processing Pipeline Module Requirements	SPIRE-ICS-DOC-002998	2.1
SPIRE Pipeline Design Document		0.1
Herschel Products Definitions Document	HERSCHEL-HSC-DOC-0959	0.95

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2. Test Setup

The tests were run on a Mac Book Pro, using the following configuration.

- Leopard 10.5.6
- 4 GB of RAM
- Java(TM) SE Runtime Environment (build 1.6.0_07-b06-153)

The install of HCSS used for the acceptance testing was the 1.0.3 user release of the HCSS. During installation, the Advanced installation was selected to allow access to the additional SPIRE tools, such as obsExporter, that are not installed using the default installation.

Additional software used during the acceptance testing included:

- Firefox 3.0.10
- Adobe Acrobat 9.0
- ds9

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3. Executed Acceptance Tests

3.1 - Test 1 : Access products using HSA Browser

Starting Conditions:

- A set of pipeline products available in the HSA
- Tester has been set up as an Authorised User of HSA

Scenario(s) tested:

- Accessing products

Procedure Summary:

Part1

- Log on over web to HSA as Authorised User
- Select products in HSA
- Retrieve data from HSA into local pool

Part2

- Start HIPE
- Browse HSA files
- Import Products into local pool

Test executed by: Brian O'Halloran

Date of Test: 2009-06-17.

Scenario(s) tested:

- Accessing products

Results:

Part1

- The actor logged onto the HSA via HCSS as an authorised user.
- The has was searched for SPIRE products, and several photometer observations were available.

Part2

- The user selected the photometer jiggle map observation 1342178704 for download. However, the user was unable to download it due to proprietary rights rights.

Conclusions: SPIRE products were available for browsing, however the user was unable to download them for saving into a pool – we can consider this a partial PASS.

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3.2 - Test 2: Access products and run first stage of pipeline via a database

Starting conditions:

- A remote database

Scenario(s) tested: Access a remote database and run the Level 0 to Level 0.5 pipeline.

Procedure:

- Start obsExporter
- Select available remote database
- Enter the Observation ID to be processed
- Run pipeline to convert from Level 0 to Level 0.5
- Browse Products in a Session using DatasetInspector
- Check SPIRE products for compliance with their specification

Test executed by : Brian O'Halloran

Starting conditions:

- Access to a remote database at RAL (sovt_2_e5@chesterfield)

Results:

- obsExporter was successfully started, and the connection was made to the [sovt_2_e5@chesterfield](#) database at RAL successfully.
- Several photometer observations were retrieved via obsExporter, namely 3221226248 (POF2), 3221226239 (POF3), 3221226247 (POF5) and 3221226234 (POF9).
- For the case of the POF2 observation 3221226248, the Level 0 to Level 0.5 conversion was run from within obsExporter successfully.
- Products were successfully browsed using DatasetInspector.
- SPIRE products were checked for compliance against their specification.
- Total time for required for access & processing the datasets ~ 10 minutes.

Conclusions: The actor was successfully able to access a dataset on a remote database, download and initially process the dataset to Level 0.5, as specified. The test can be thus considered to have been PASSED.

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3.3 - Test 3: Browse and Access Products from Local Pool

Starting conditions:

- A local pool

Scenario(s) tested:

- Browse and Access Products

Procedure:

- Start HIPE
- Select available Local Pool
- Start Product Browser
- Extract Products into HIPE session
- Browse available Tasks for Spectroscopy and Photometry
- Browse available Tasks for a specific Product
- Inspect the History of a Product
- Browse Products in a Session using DatasetInspector
- Check SPIRE products for compliance with their specification

Test executed by: Brian O'Halloran

Date: 2009-06-05

Test Results:

- 1) HIPE was started and the Local Pool 'myTestPool5', containing the saved products from Test 2 (obsid: 3221226248).
- 2) The product browser was started, and the products were successfully extracted into the the HIPE session.
- 3) Task browser was opened and available tasks were inspected successfully.

Conclusions: The actor was successfully able to browse and access products from a local pool, as specified. The test can this be considered to have been PASSED.

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3.4 - Test 4: Run Pipeline

Starting conditions:

- A local pool

Scenario(s) tested:

- Run Pipeline(s)

Procedure:

- HIPE started
- Select pool
- Start automatic pipeline application connected to pool
- Operator monitor this process

Test executed by: Brian O'Halloran

Date: 2009-06-09

Test Results:

As part of the acceptance testing process, I executed a number of photometer pipelines (POF2, POF3, POF5 and POF 9) and a spectroscopy pipeline (SOF1).

3.4.1 Pools access:

Several pools were set up containing photometer observations downloaded via obsExporter, as per Test 2. PASS.

3.4.2 POF 2 pipeline (obsID: 3221226248):

Pipeline was executed using the standard pipeline script for POF2 (D_SPIRE_IA_PIPELINE_SCRIPTS_1_11).

New set of calibration files generated successfully using cal_import before pipeline processing was attempted. HIPE successfully used this new set of calibration files for all POF and SOF pipelines.

Level 0 to Level 0.5 processing – processing proceeded as expected, with the products produced following the SPIRE products definitions document.

Level 0.5 to Level 1 processing – Processing was performed using the standard parameters for the respective modules. On inspection of the output products, the following problems were encountered :

1. The flux and error values in the PPP output product were set to fixed values.

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2. Units were not set for the output values in the Photometer Pointing Product.
3. Units were not set for the output values in the Averaged Photometer Pointing Product.

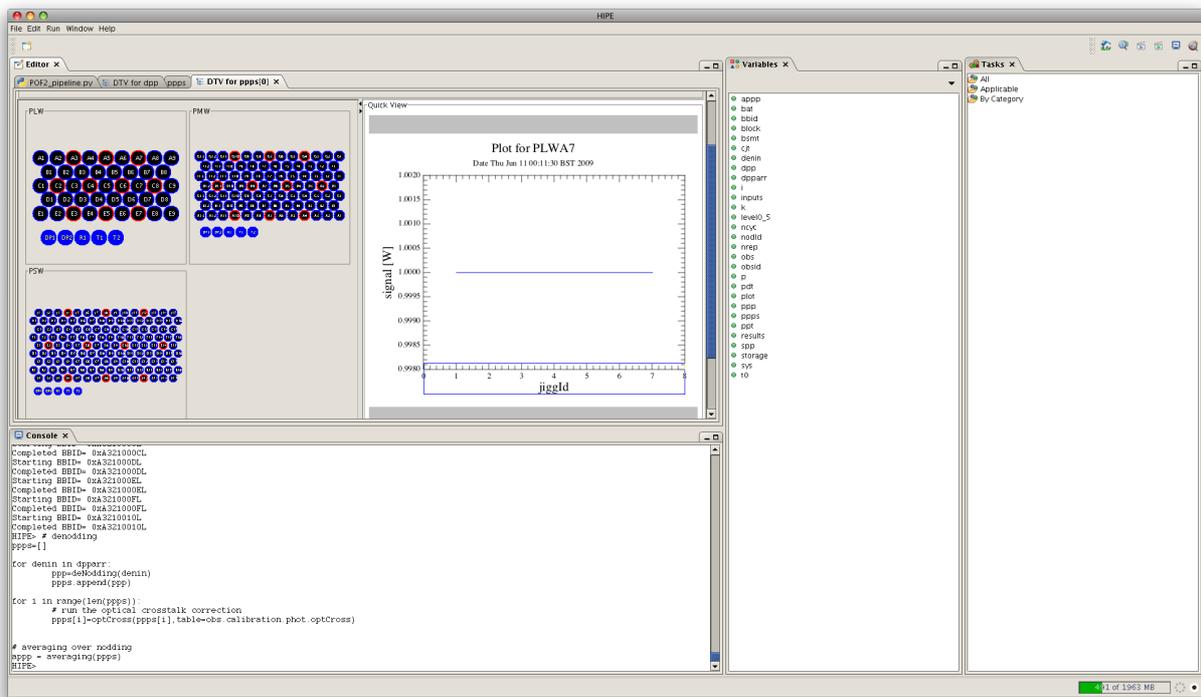


Fig 1. POF2 pipeline – output of the PPP product

Level 1 to Level 2 processing – given the issue encountered in the previous level of processing, processing otherwise proceeded as expected, with the products produced following the SPIRE products definitions document. The final output point source products did not have the required units – this needs to be fixed in the point source module code.

Total run time for the POF 2 pipeline – 25 minutes.

Conclusions: The fixed flux values and error values in the output products are a serious error (this has been traced to a bug in the denodding module, and has subsequently been rectified). The lack of units in the output products is a less serious problem, but this situation is contrary to the product specification as outlined. Given the nature of the problems encountered, the conclusion must be that the POF2 pipeline processing has failed.

3.4.3 POF 3 pipeline (obsID: 3221226239):

Pipeline was executed using the standard pipeline script for POF3 (D_SPIRE_IA_PIPELINE_SCRIPTS_1_11).

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Level 0 to Level 0.5 processing – processing proceeded as expected, with the products produced following the SPIRE products definitions document.

Level 0.5 to Level 1 processing – Processing was performed using the standard parameters for the respective modules. On inspection of the output products, the following problems were encountered :

1. Units were not set for the output values in the Photometer Pointing Product.
2. Units were not set for the output values in the Averaged Photometer Pointing Product.

The fixed value problem as seen in the POF2 pipeline processing is not present.

Level 1 to Level 2 processing – given the issue encountered in the previous level of processing, processing otherwise proceeded as expected, with the products produced following the SPIRE products definitions document, with the except of units not being present in the output PPP and APPP products.

Level 2 map products were successfully exported to FITS files.

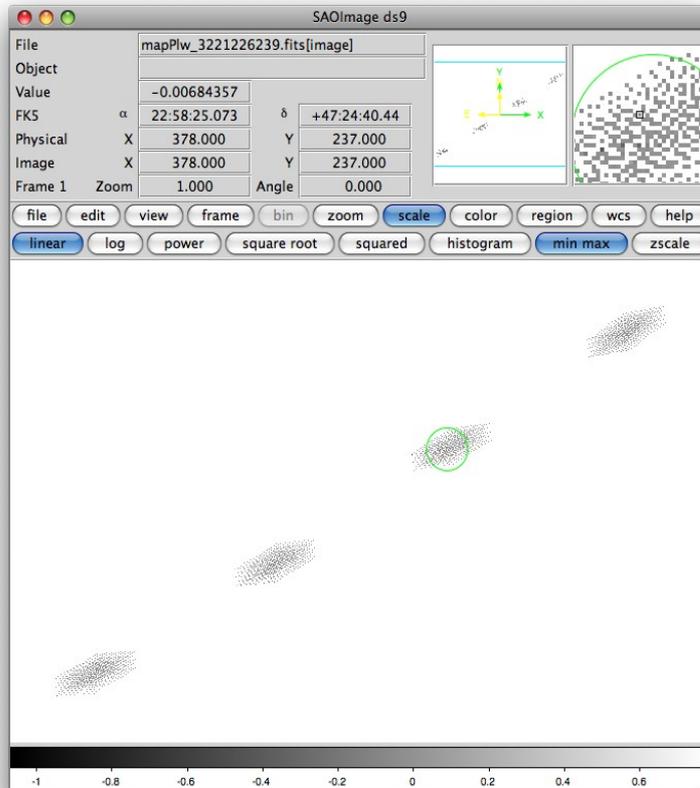


Fig 2. PLW Map for the POF3 SOVT-2 observation 3221226239.

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Total run time for the POF 3 pipeline – 30 minutes.

Conclusions: The pipeline was successfully propagated, with the output products following the expected specifications. The POF3 pipeline processing test can be considered to have PASSED.

3.4.4 POF 5 pipeline (obsID: 3221226247):

Pipeline was executed using the standard pipeline script for POF5 (D_SPIRE_IA_PIPELINE_SCRIPTS_1_11).

Level 0 to Level 0.5 processing – processing proceeded as expected, with the products produced following the SPIRE products definitions document.

Level 0.5 to Level 1 processing – Processing was performed using the standard parameters for the respective modules. Inspection of products produced following the completion of the POF5 Level 1 processing were confirmed to be following the SPIRE products definitions document.

Level 1 to Level 2 processing – Processing proceeded as expected, with the products produced following the SPIRE products definitions document,.

Level 2 map products were successfully exported to FITS files.

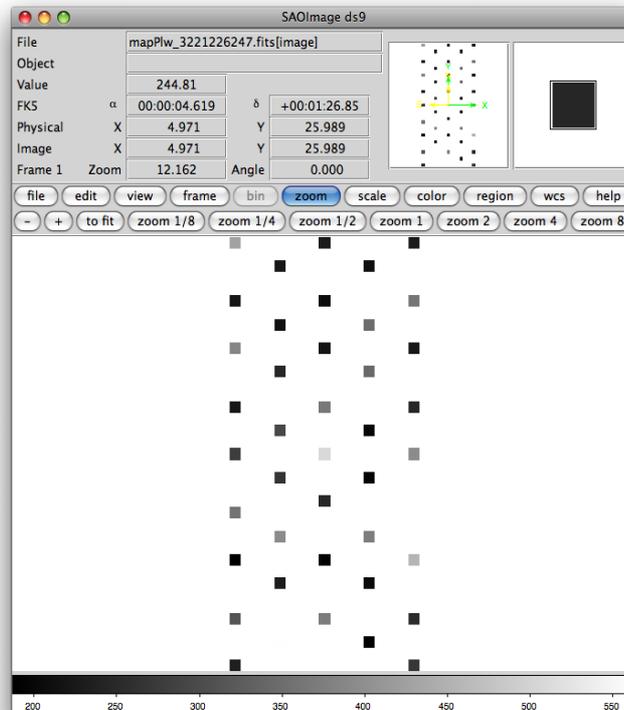


Fig 3. PLW Map for the PO5 SOVT-2 observation 3221226247.

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Total run time for the POF 5 pipeline – 45 minutes

Conclusions: The pipeline was successfully propagated, with the output products following the expected specifications. The POF5 pipeline test can therefore be considered as PASSED.

3.4.5 POF 9 pipeline (obsID: 3221226234):

Pipeline was executed using the standard pipeline script for POF5 (D_SPIRE_IA_PIPELINE_SCRIPTS_1_11).

Level 0 to Level 0.5 processing – processing proceeded as expected, with the products produced following the SPIRE products definitions document.

Level 0.5 to Level 1 processing – Processing was performed using the standard parameters for the respective modules. Inspection of products produced following the completion of the POF9 Level 1 processing were confirmed to be following the SPIRE products definitions document.

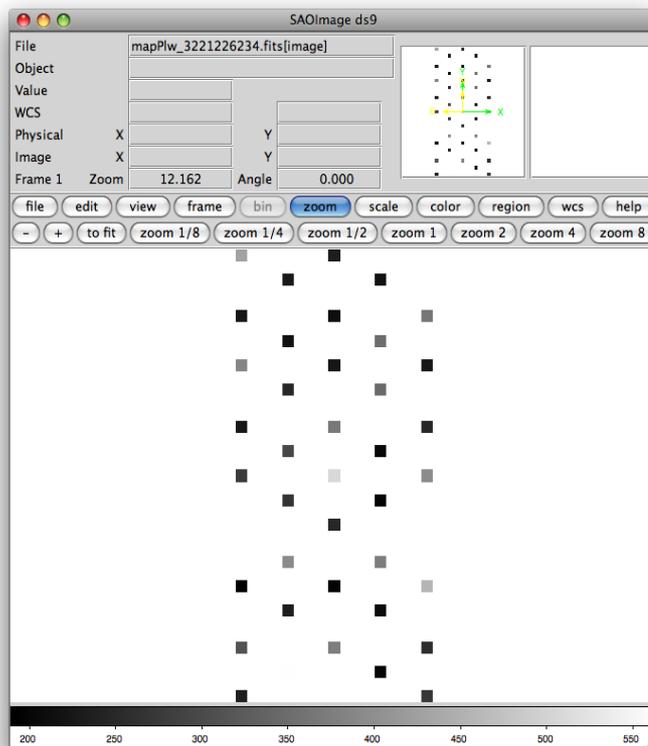


Fig 4. PLW Map for the PO9 SOVT-2 observation 3221226234.

Level 1 to Level 2 processing – Processing proceeded as expected, with the products produced following the SPIRE products definitions document.

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Level 2 map products were successfully exported to FITS files.

Total run time for the POF 9 pipeline – 1 hour.

Conclusions: The pipeline was successfully propagated, with the output products following the expected specifications. The POF9 pipeline processing test is therefore considered as PASSED.

3.4.6 *SOF1 pipeline* (obsID: 805378046):

As no spectrometer datasets were available from either the HSA nor through obsExporter and the SOVT-2 databases, I had to download and use the spectrometer pools available on winchester that were provided by Ed Polehampton for use with the March ESA Workshops.

Pipeline was executed using the standard pipeline script for SOF1 (D_SPIRE_IA_PIPELINE_SCRIPTS_1_11), and the demo script provided for the ESA March workshops using the 30017fe pool provided.

The demo script provided the tester the opportunity to very easily inspect the intermediate data products, such as the corrected and uncorrected interferograms by interactively plotting the Level 1 products as they were produced. The products were additionally accessible via the Variables pane for each level of processing for inspection.

The SPG SOF1 script worked as expected for v1.0.3, producing Level1 products in the form of a spectrum and an interferogram. The demo script likewise produced the expected final products, though the demo script guided the user in much greater detail and interactivity as to how the final products are arrived at.

Spectral pipeline products were successfully exported to FITS files and to a local store. - see below for examples of output from intermediate products along the pipeline.

Total run time for the SOF1 pipeline – 30 minutes.

Conclusions: The pipeline was successfully propagated, with the output products following the expected specifications. The SOF1 pipeline test is therefore considered as PASSED.

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3.5 - Test 5: Process Products

Starting conditions:

- HIPE started
- Products extracted into HIPE session
- Calibration Products available from private pool

Scenario(s) tested:

- Process Products

Procedure:

- Stepwise execution of the pipeline standard processing steps
- Visualization of temporary results
- Modify input parameter for a pipeline step
- Command line support by command completion mechanism
- Compare results (Display and Plot)
- Plug in of private Jython and Java Tasks without restarting HIPE
- Reloading of Jython and Java Tasks without restarting HIPE
- Execute private or modified Jython/Java Task
- Browse History of Products

Test executed by: Brian O'Halloran

Date: 2009-06-09

Test Results:

To test the processing of products, we used the demo script from the SOF1 pipeline used for Test 4.

As no spectrometer datasets were available from either the HSA nor through obsExporter and the SOVT-2 databases, I had to download and use the spectrometer pools available on winchester @RAL that were provided by Ed Polehampton for use with the March ESA Workshops.

Running the SOF1 pipeline for obsid 805378046, below are some examples from output from the intermediate products produced:

Plotting the input of Time Domain Phase Correction and the output of the task:

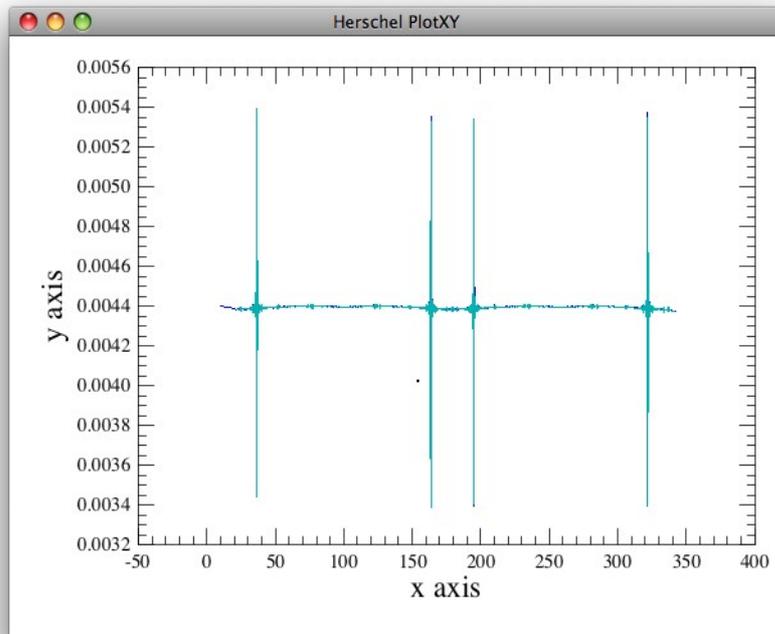


Fig 5: Output from the Time Domain Phase Correction

Plot the detector timeline and the mechanism timeline: these two are combined to form the interferogram:

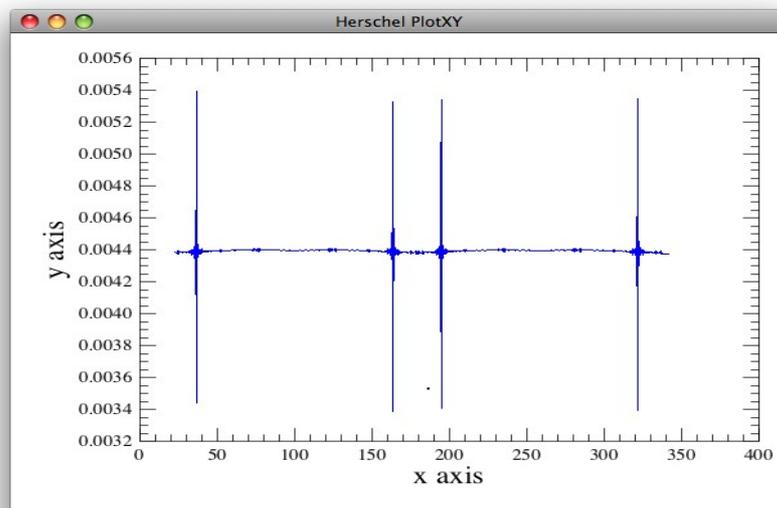


Fig 6: Detector timeline

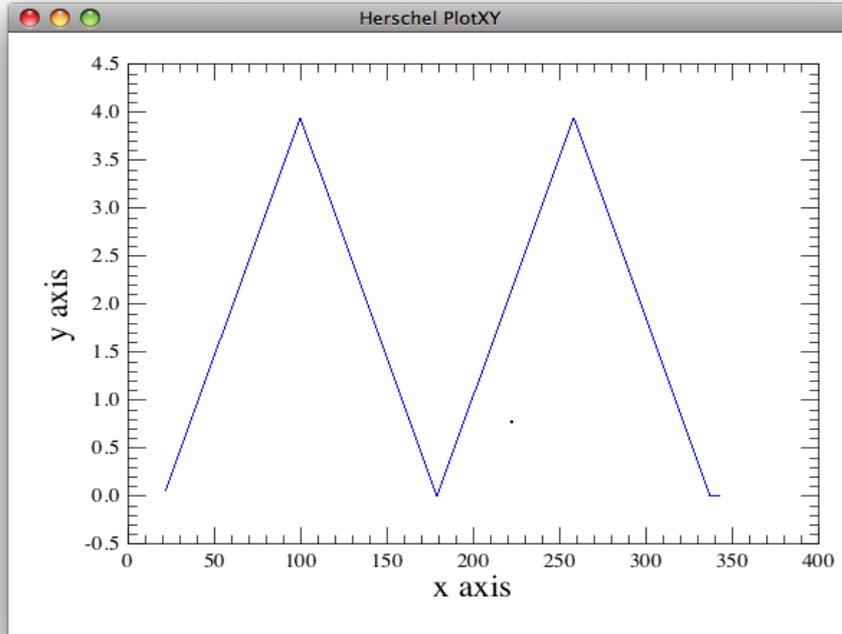


Fig 7: Mechanism timeline

Corrected forward and reverse scans:

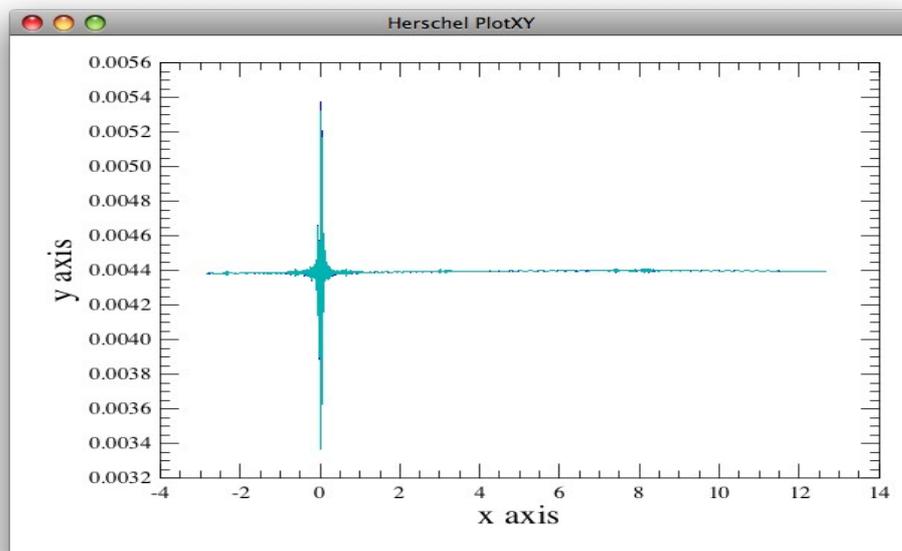


Fig 8: Corrected forward and reverse scans

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Examining the spectrum without phase correction - real and imaginary parts:

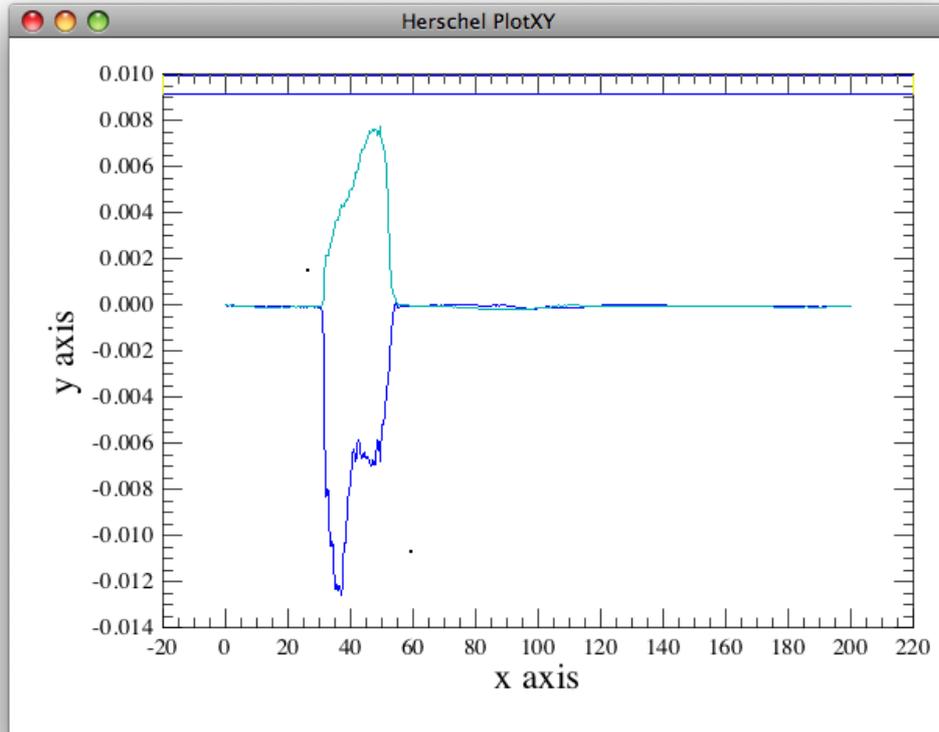


Fig 9: Spectrum without phase correction

Plotting the resulting corrected interferogram post phase correction:

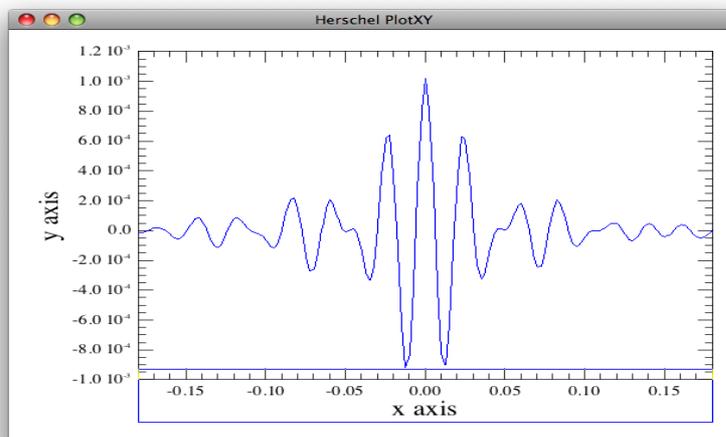


Fig 10: Corrected interferogram post phase correction

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The final spectrum - plot of the SSW centre pixel:

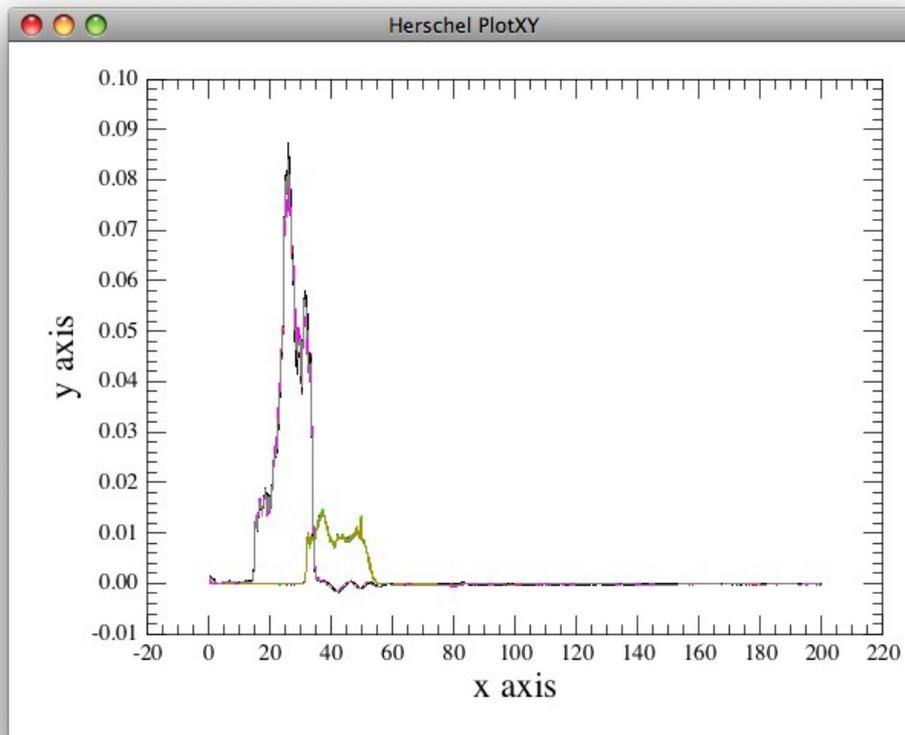


Fig 11: Plot of the SSW centre pixel

Conclusions: We were able to stepwise execute the pipeline standard processing steps for the SOF1 pipeline. We successfully performed visualization of temporary results.

Modify input parameter for a pipeline step – we successfully altered the phase correction performed, by altering the input parameters (polyDegree, pcfSize) required.

Results were plotted successfully.

History of Products was successfully accessed and browsed.

This test is therefore considered as PASSED.

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3.6 - Test 6: Import and Export of Data Products

Starting conditions:

- A local pool

Scenario(s) tested:

- Browse and Access Products

Procedure:

- Start HIPE
- Select available Local Pool
- Start Product Browser
- Extract SPIRE Products into HIPE session
- Browse available Tasks for Spectroscopy and Photometry
- Inspect the History of a Product
- Browse Products in a Session using DatasetInspector
- Export processed SPIRE product(s) from HIPE to local pool

Test executed by: Brian O'Halloran

Date: 2009-06-09

Test Results:

This test in essence forms a subset of Tests 4 and 5 – we performed this test by selecting the local pools 300017fe for spectroscopy and 3221226234 for photometry.

We extracted the SPIRE products for both into HIPE successfully, and were able to access and browse the available tasks.

On running the pipeline, we browsed the products, inspected the history and finally exported them into a local pool.

The import and export of data products test is therefore considered as PASSED.

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3.7 - Test 7: Access Documentation

Starting conditions:

- HIPE started
- Products extracted into HIPE session

Scenario(s) tested:

- Access Documentation

Procedure:

- Access User Manual
- Print a Chapter of a User Manual
- Click on a Product to get view/possible pipeline applications/product description
- Get pipeline scripts (code) related to a certain Product
- Get synopsis of a certain Task

Test executed by: Brian O'Halloran

Date: 2009-06-15

Test Results:

I started HIPE and clicked on the Documentation icon- the jetty service was started successfully and created a tab within Firefox 3.0.11 listing the documentation bundled within the 1.0.3 build.

I accessed the SPIRE UM without any problems (HTML, Javadoc and PDF versions) and successfully printed Chapter 4.

For the denodding module used in the POF2 pipeline, I was able to successfully access the SPIRE URM entry to inspect the synopsis of the task.

Finally, I was able to inspect the code for the POF2 pipeline used to create the Averaged PPP product produced by the denodding task by exploding the dp-spire_src jar file in the src directory – this is only possible if the tester uses the Advanced Installation option when first installing HIPE.

Conclusions: The access of documentation test can be considered as PASSED.

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3.8 - Test 8: Workspace handling

Starting conditions:

- HIPE started
- Products present within HIPE

Scenario(s) tested:

- Workspace handling

Procedure:

- Save Workspace (command history, parameter settings, Products,...)
- Restore crash: Restore last saved Workspace

Test executed by: Brian O'Halloran

Date: 2009-06-16

Test Results:

Individual window were adjusted in the following ways.

Window resizing – windows were maximized and minimised. Clicking and dragging borders of each of the windows allowed for expansion in any direction of any of the views.

Right clicking on the view tab provides a pull-down menu that allows some default window resizing and also tab placement and direction of written label

Windows can be moved inside the HIPE workspace by clicking on the window itself and dragging to another part of the work bench.

The user completely undocked a window view by holding the right mouse button down while on the window tab.

Moving Between Windows in a View. Windows can be moved inside a view using the arrow buttons to the top right of the view. The left and right arrows toggle through the windows available in a view, while the down arrow allows window selection from a list.

This was done for both the Work bench and the Full Work Bench perspectives.

To perform the saving of a workspace, we performed a POF2 pipeline script up as far as the generation of the Level 2 products. There was no documentation available – HOWTO or UM - that indicated how to save the command history etc., so the tester was unable to properly test this scenario.

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Conclusions: The user was able to successfully manipulate the various work environments within the HCSS. However, no documentation was available to allow him to undertake the final part of the test scenario, namely the saving and restoration of the previous workspace. As a results of this, this test scenario is a partial FAIL.