

SPIRE Photometer Data Reprocessing

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on behalf of the SPIRE ICC, the HSC and the NHSC





Reasons for Reprocessing

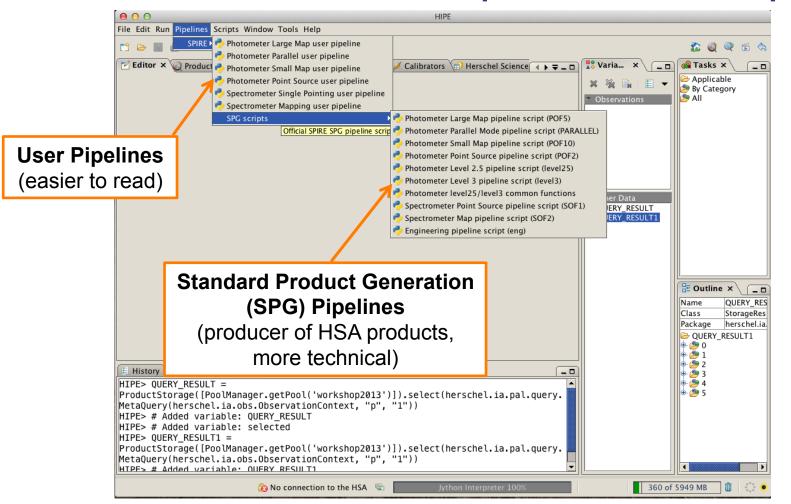
- If the Data is OK
 - To include turn-around data.
 - Maps need re-gridding different pixel size
 - Merging of multiple observations
 - Astrometry correction

- If there are Artifacts
 - Residual stripes due to cooler burp
 - Undetected glitches/ ringing
 - Undetected thermistor jumps
 - Undetected signal jumps
 - Stripes due to bright sources





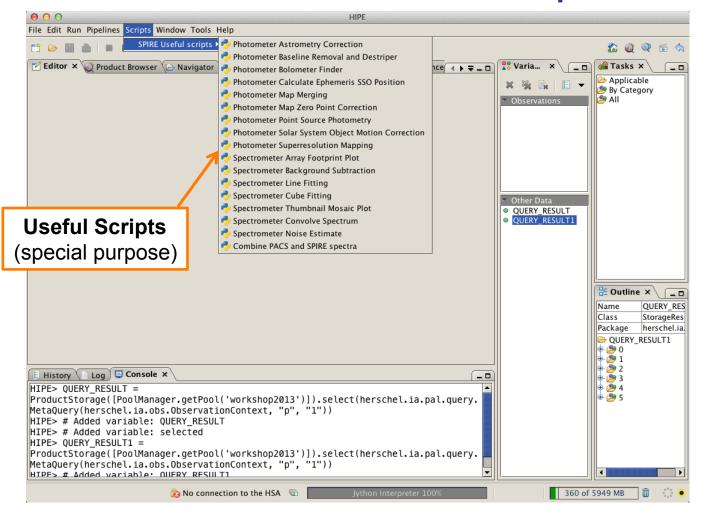
Toolbox: User Scripts, SPG Scripts







Toolbox: Useful Scripts







Toolbox: Tasks Tasks 00 HIPE - spiaLevel2 File Edit Run Pipelines Scripts Window Tools Help **Selected variable** 🏠 🔘 🔍 📂 🥎 "Applicable" 🗹 Editor 🗙 🥥 Product Browser 🕼 Navigator 🕕 SPIRE Calibration 🌽 Calibrators 🔝 Herschel Science A 🔪 🖛 🗖 🗖 🚦 Variables 🗙 . 🗖 🔐 Tasks 🗙 --shows only Applicable 😡 spiaLevel 1 🗙 🔘 spiaLevel 2 🗙 🗙 🦗 🛼 boloFinderTool Inputs historyExtract Observat those tasks that gualAssessSpireLevel05 Main Additional Observations Baseline removal Destriper Mapmaking Parameters Position Offset Zero... obs gualAssessSpireLevel1 obs 1 😑 obsOut cal*: 😑 cal obs*: can be applied gualAssessSpireLevel2 obsOut ● radialV obsOut1 CopyObs: Yes updateLevel1: Yes • saveProduct to the currently spiaConcatL1 baselRem: Inactive Active • • DestriperOn: spiaFtsBackgroundRemoval spiaLevel05 selected extSrcGains: Yes • MapMaker: • Destriper spiaLevel1 spiaLevel1Repair variable. ssoMaps: Active • extendedMaps: Active spiaLevel2 spiaLoadCal spiaPlotPosition SsoFrameExt: No displayMap: Yes • • spiaSaveMaps2Fits • spiaSaveObs Yes No makeBrowseImage: useTempPool: spirePhotLargeMapPipeline All tasks that 😕 By Category 🍋 All **SPIA Tasks** take an • 🗄 Outline 🗙 - 0 observation context as input Outputs will appear History 🚺 Log 📮 Console 🗙 _ 0 when an HIPE> obsOut2 = spiaLevel2(obs=obs, cal=cal, obs2=obs1) 🗁 obsOut Copying original observation. 🕂 🃂 History including 12 scans observation is auxiliary including 12 scans browselmageProduct Baseline remover not applied! Other Data browseProduct selected in the Using start parameters from diagnostic product! cal calibration (spire cal 11 java.lang.RuntimeException: I/O Error creating the map: Error at doIteration to make level0 Variables View. map: Destriper can not handle scans concatenated from the same observation. 582 of 5333 MB 🔒 beschulz 🛛 🛍 Î





Reprocess an Observation

- Script Solution with User Script
 - load User script
 - one of: Large Map, Small Map, Parallel Mode
 - Edit User script entries:
 - myObsid = enterOBSID
 - myDataPool = "Enter Pool name here"
 - outDir = "/enter/path/here/"
 - Run script by clicking the green double arrow in the top toolbar of HIPE.
 - Upon completion the resulting maps will be saved in the directory "outDir" and also be available in the level 2 context of the observation context "obs"





Reprocess an Observation

- Script Solution with SPIA
 - load observation with



- obs = getObservation(enterOBSID,poolName='hsa')
- MyHSA in Product Browser must be on-line for this
- Run the following commands in the console or from a script:
 - cal = spiaCal()
 - obsOut = spiaLevel1(obs=obs, cal=cal)
 - obsOut = spiaLevel2(obs=obsOut, cal=cal, CopyObs="No")
 - Results will be in Level 2 context of "obsOut"
- Upon completion the resulting maps will be available in the level 2 context of the observation context "obs"





Reprocess an Observation

- Interactive Solution with SPIA
 - Load observation with Product Browser
 - Double-click task spiaCal and click "Accept"
 - Double-click task spiaLevel1
 - Drag variable "cal" onto "cal" input parameter in GUI.
 - Drag observation context to input parameter "obs".
 - Click "Accept"
 - Double-click task spiaLevel2
 - If "obsOut" not already in "obs" input parameter drag it there.
 - Drag variable "cal" onto "cal" input parameter in GUI.
 - Click "Accept"
- Results will be in Level 2 context of "obsOut1"
 - Upon completion the resulting maps will be available in the level 2 context of the observation context "obsOut1"\
- Check out the demo videos of SPIA at the SPIA homepage.
 - Note that the software has evolved a bit meanwhile but the basics are still the same.









Solutions (Data OK)

- To include turn-around data.
 - Reprocess data from Level 0.5
 - User script:
 - includeTurnaround = False
 - SPIA:
 - set "extend" to "Yes"
- Merging of multiple observations
 - Edit and execute Useful script: Photometer_MapMerge.py
 - obsids = [<OBSID1>, <OBSID2>]
 - pools = ['<POOL1>', '<POOL2>']
 - outDir = "<output_directory>"
 - SPIA:
 - obsOut = spiaLevel2(obs=obs, cal=cal, obs2=obs1)
- Astrometry correction
 - Run useful script with same name

- Maps need re-gridding to different pixel sizes
- example 12" pixels
 - Reprocess data from level 1
 - User script: Edit script
 - mapPlw=naiveScanMapper(scans , array="PLW", method=UnweightedVariance, resolution=12)
 - mapPmw=naiveScanMapper(scan s, array="PMW", method=UnweightedVariance, resolution=12)
 - mapPsw=naiveScanMapper(scan s, array="PSW", method=UnweightedVariance, resolution=12)
 - SPIA:
 - obsOut = spiaLevel2(obs=obs, cal=cal, MapMaker='naive', pixelSizePsw=12.0, pixelSizePmw=12.0, pixelSizePlw=12.0)









Solutions (Artifacts)

- Undetected glitches/ringing
 - Reprocess from Level 0.5 with different deglitcher or different parameters
 - Use SpireMaskEditor
 - Use boloFinderTool
- Residual stripes due to cooler
 burp
 - Run User script with coolerBurpCorrection = True
 - Use SpireMaskEditor and reprocess from Level 1 or Level 0.5
 - Edit diagnostic product and feed back into destriper
- Undetected thermistor jumps
 - Reprocess from Level 0.5 with bolometer jump detection on
 - Use boloFinderTool to find scan and SpireMaskEditor to eliminate readouts

- Undetected signal jumps
 - Reprocess from Level 0.5 with bolometer jump detection on
 - Use boloFinderTool to find scan and SpireMaskEditor to eliminate readouts
- Stripes due to bright sources
 - Reprocess from level 1 with smaller brightSourceThresh for Destriper
 - Reprocess from level 1 with destriper Region of Interest (ROI) excluding bright source
- Normally several solutions are possible and the outcome will depend on the specific case.
- For help with specific solutions consult the online documentation or the NHSC Helpdesk.

