# SPIRE Photometer Data Reprocessing

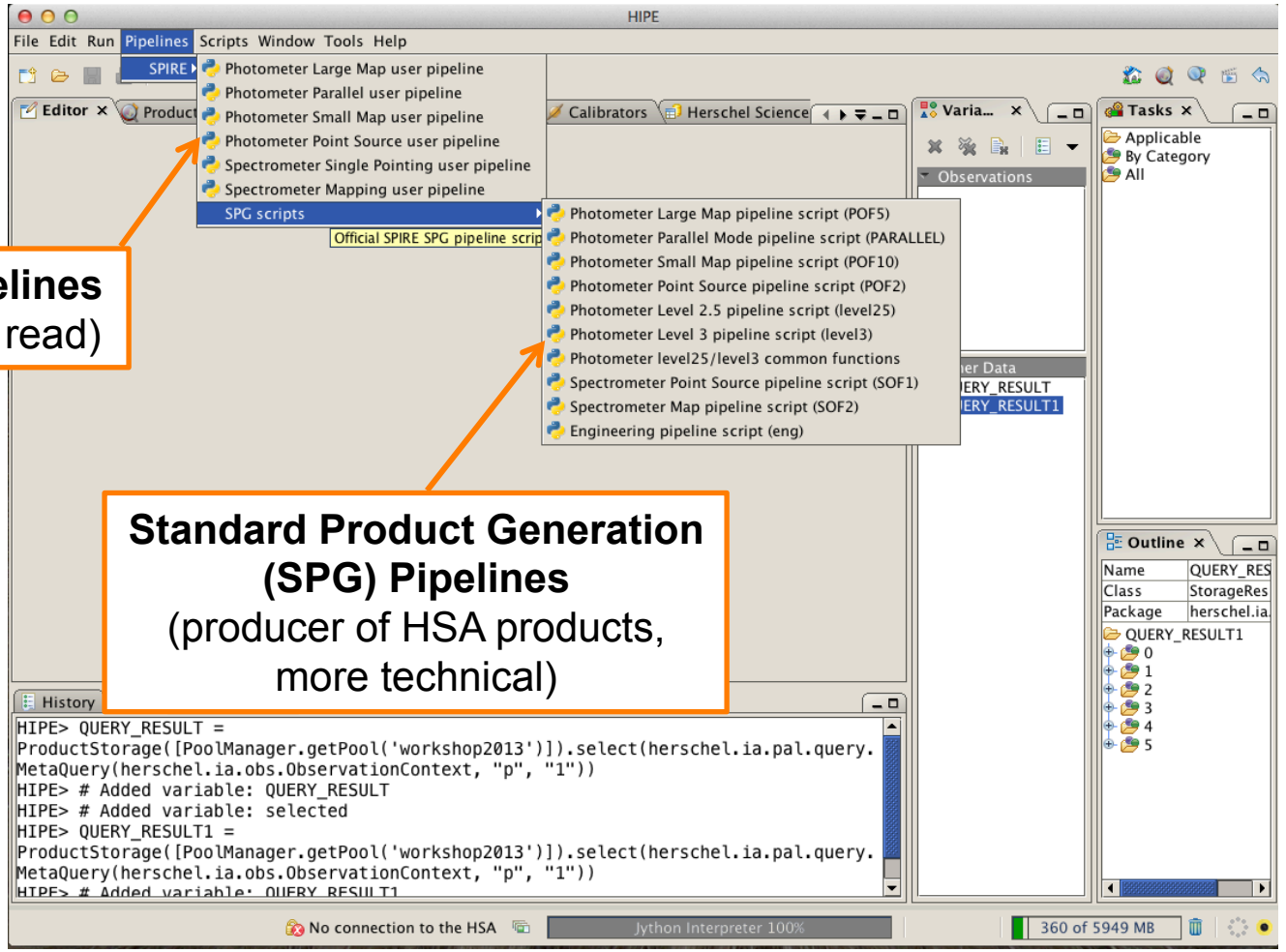
Bernhard Schulz (NHSC/IPAC)

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

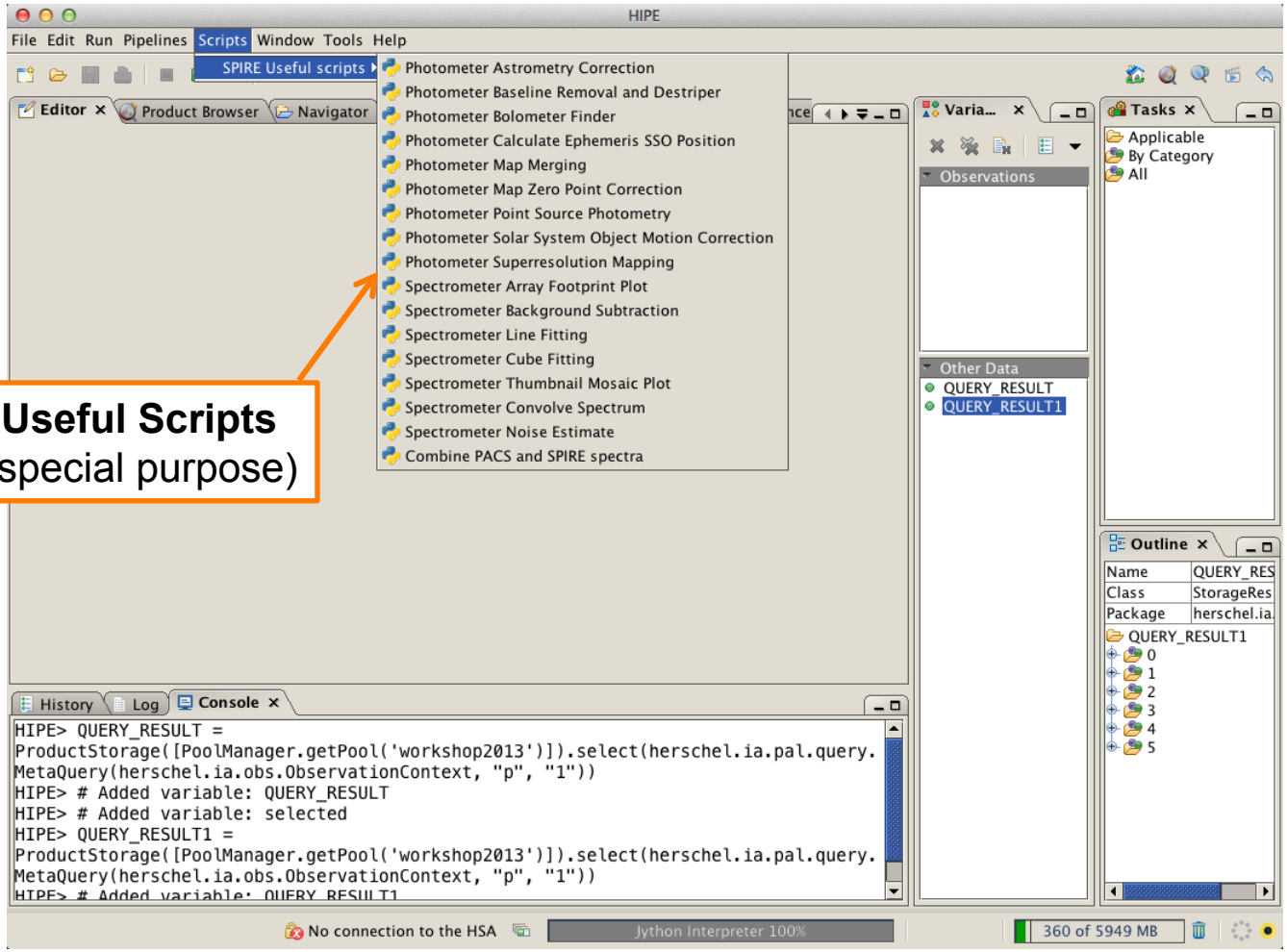
# Toolbox: User Scripts, SPG Scripts



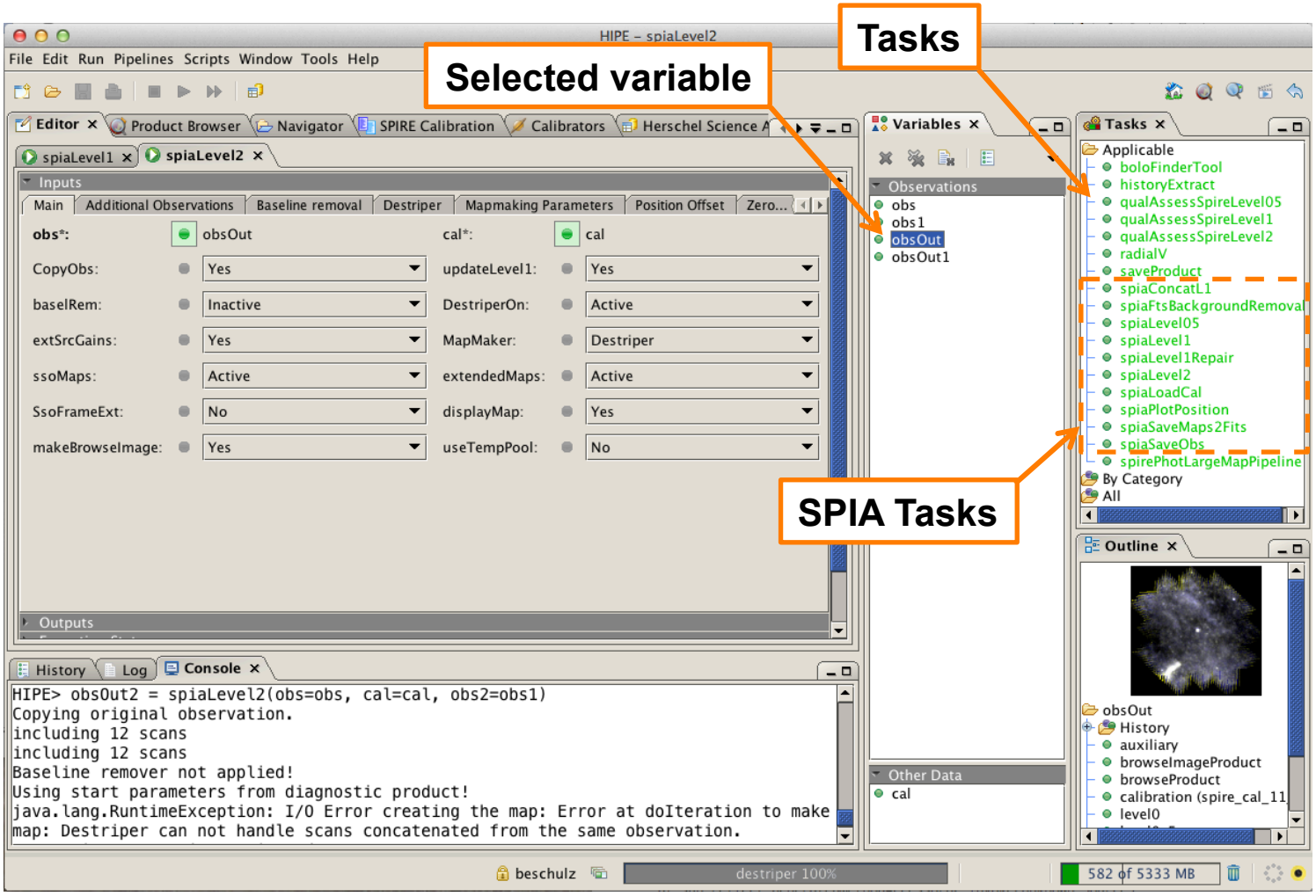

**User Pipelines**
(easier to read)

**Standard Product Generation (SPG) Pipelines**
(producer of HSA products, more technical)

# Toolbox: Useful Scripts



# Toolbox: Tasks




"Applicable" shows only those tasks that can be applied to the currently selected variable.

All tasks that take an observation context as input will appear when an observation is selected in the Variables View.

# 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

Don't forget to install the quick fix for HIPE 12.1
see SPIA homepage
https://nhscsci.ipac.caltech.edu/sc/index.php/Spire/SPIA

- 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

Don't forget to install the quick fix for HIPE 12.1
see SPIA homepage
https://nhscsci.ipac.caltech.edu/sc/index.php/Spire/SPIA

- 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(scans, array="PMW", method=UnweightedVariance, resolution=12)
    - mapPsw=naiveScanMapper(scans, 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.