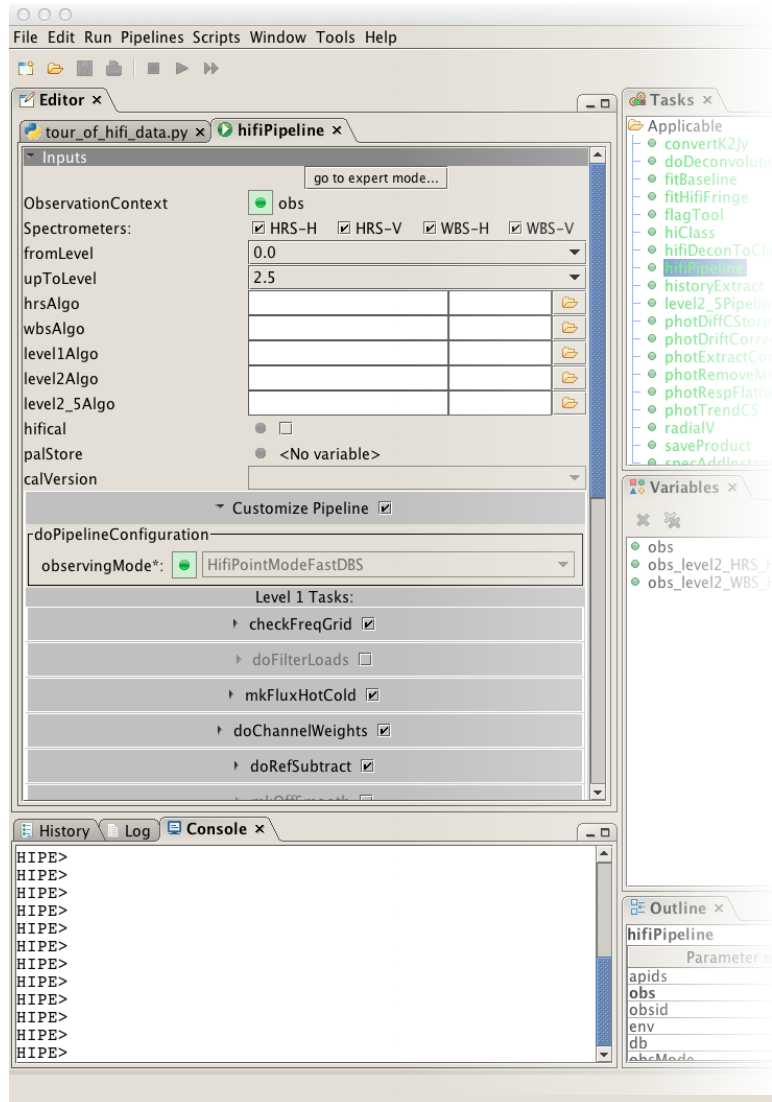
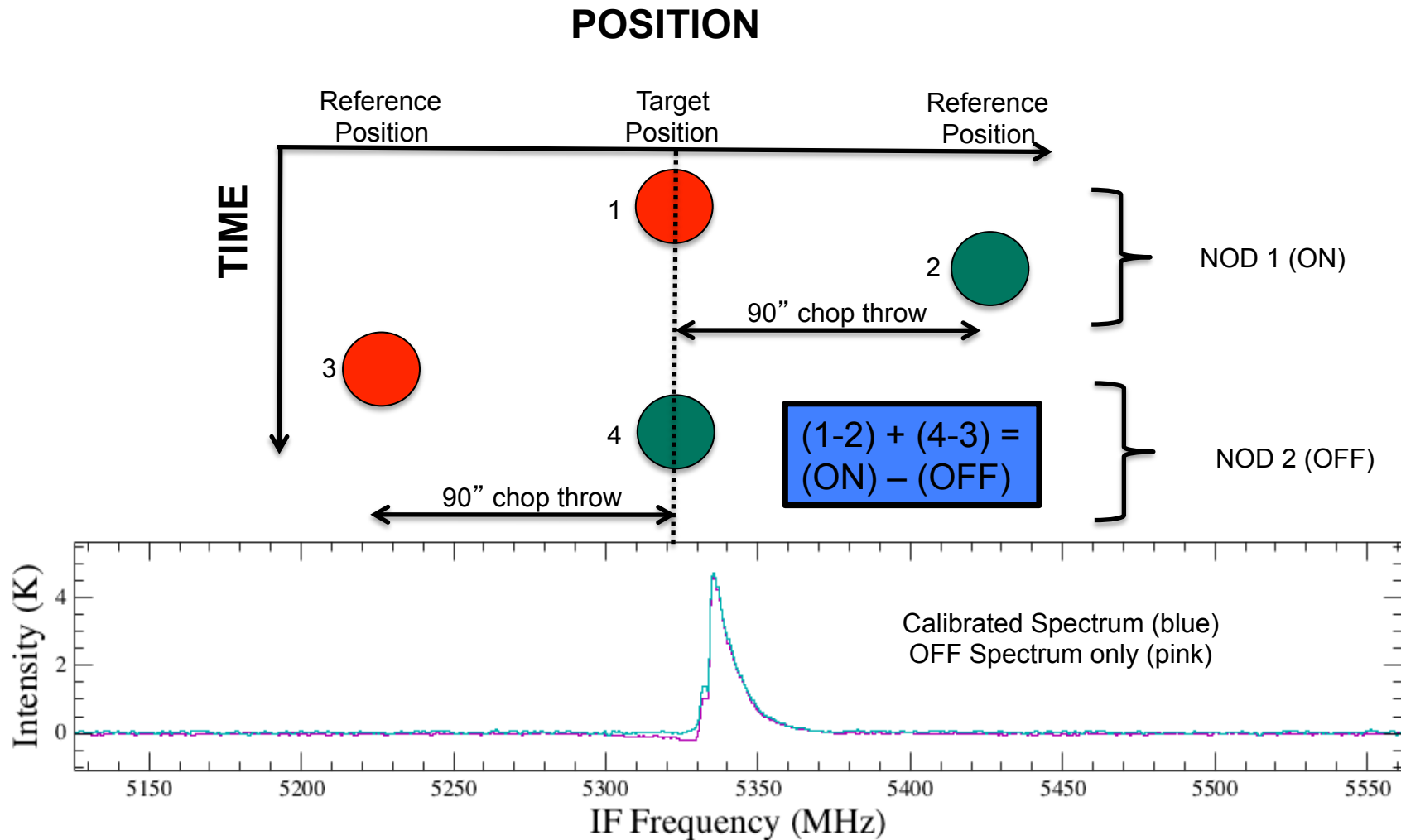


# Reprocessing HIFI Data

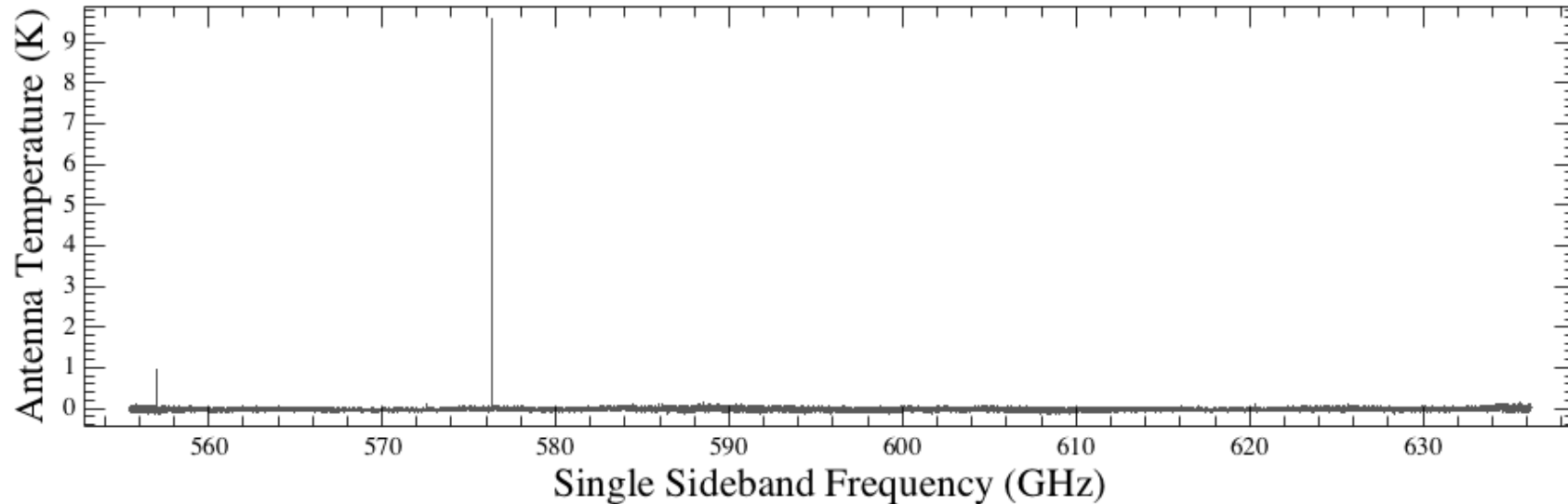


- **Why** would it be necessary to reprocess data?
  - Take advantage of new calibration updates (pointing updates require additional finesse)
  - Take advantage of improved pipelines
  - Adjust parameters in existing pipeline
  - Include new or optional steps in the pipeline
  - The pipeline is a useful aid for gauging the quality of the data
- **How** to reprocess HIFI data
  - HSC on-demand re-processing
  - Command line based
  - GUI based re-pipelining (configurable)
  - Script based re-pipelining

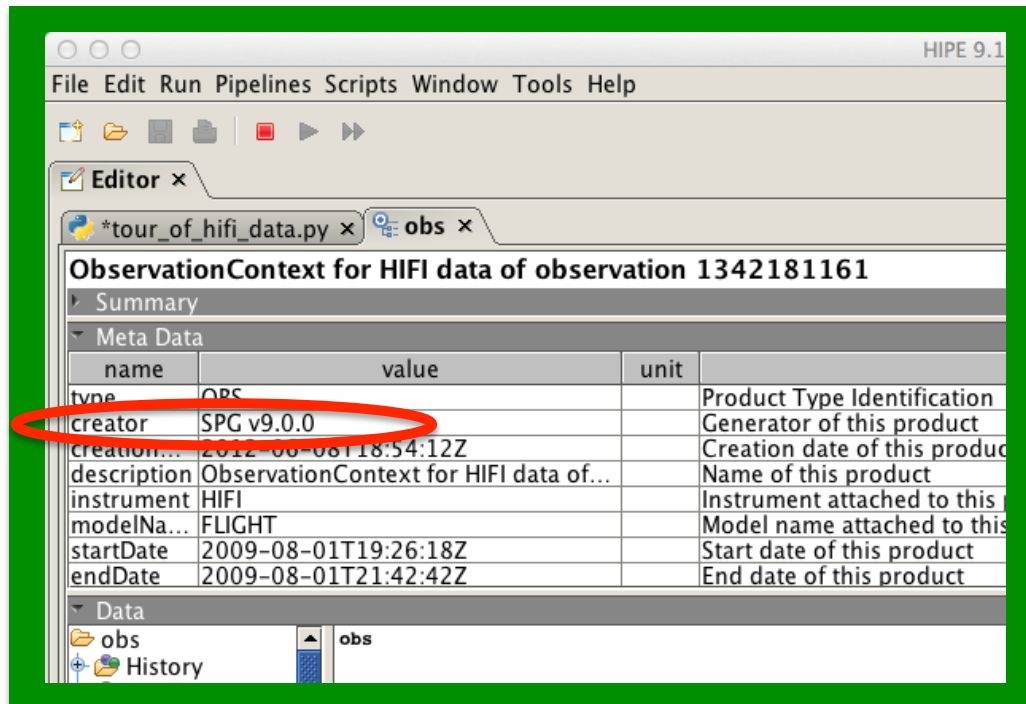
- 1342190183: Point Mode DBS with emission in a reference position



- 1342181161: DBS Spectral Scan
  - No emission in the reference beams
  - Pipeline performs an extra step compared to point mode
  - Deconvolution (discussed tomorrow) combines the spectra at different frequencies into a single spectra.



- Compare the SPG meta data against the `what's new' web  
<http://herschel.esac.esa.int/twiki/bin/view/Public/HipeWhatsNew>



HIPE 9.1

File Edit Run Pipelines Scripts Window Tools Help

Editor x

\*tour\_of\_hifi\_data.py x obs x

**ObservationContext for HIFI data of observation 1342181161**

Summary

Meta Data

name	value	unit	
type	OPS		Product Type Identification
creator	SPG v9.0.0		Generator of this product
creation...	2012-08-08T18:54:12Z		Creation date of this product
description	ObservationContext for HIFI data of...		Name of this product
instrument	HIFI		Instrument attached to this product
modelNa...	FLIGHT		Model name attached to this product
startDate	2009-08-01T19:26:18Z		Start date of this product
endDate	2009-08-01T21:42:42Z		End date of this product

Data

obs

History

## WBS Pipeline

- Introduction of quality flag to warn about saturated scans
- Introduction of a flag for a wrong scan
- Improvements to flagging of saturated scans
- Improvements to algorithm to fit to CO

## HRS Pipeline

### Level 1 Pipeline

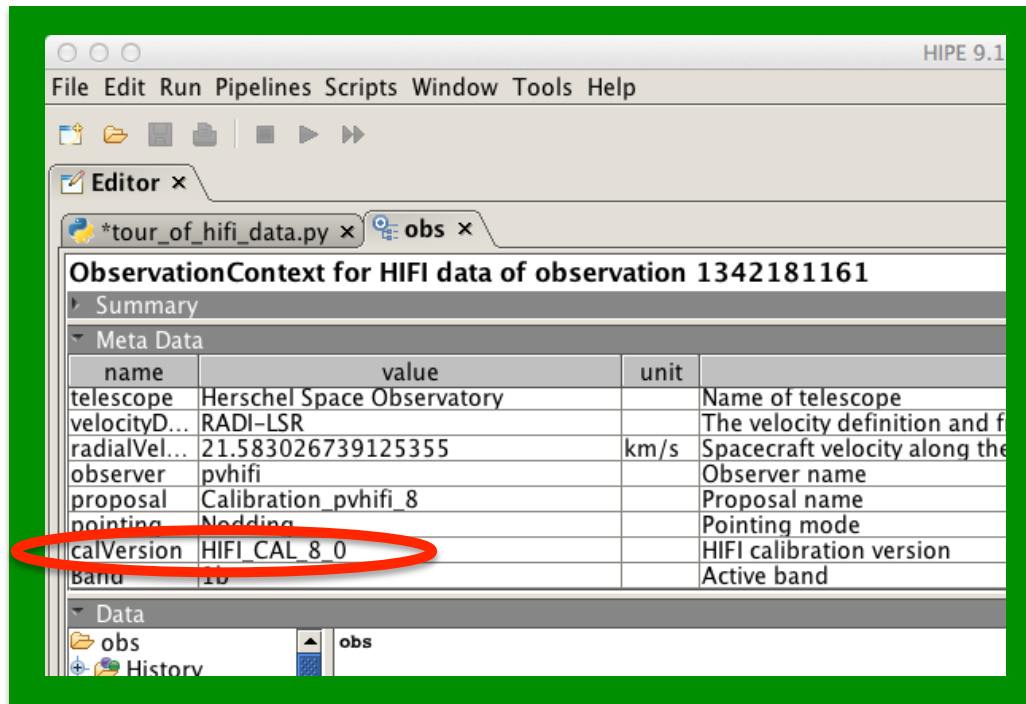
- Addition of parameters in the doFilterL
- Addition of a new quality products "flag

### Level 2 Pipeline

- doAvg now honours user-defined flags

- Compare **calVersion** meta data in the observation context against the list on the HIFI calibration web page.
- Cal updates usually tied to major releases but not always.

<http://herschel.esac.esa.int/twiki/bin/view/Public/HifiCalibrationWeb>



HIPE 9.1

File Edit Run Pipelines Scripts Window Tools Help

Editor x

\*tour\_of\_hifi\_data.py x obs x

**ObservationContext for HIFI data of observation 1342181161**

Summary

Meta Data

name	value	unit	
telescope	Herschel Space Observatory		Name of telescope
velocityD...	RADI-LSR		The velocity definition and f
radialVel...	21.583026739125355	km/s	Spacecraft velocity along the
observer	pvhifi		Observer name
proposal	Calibration_pvhifi_8		Proposal name
pointing	Nodding		Pointing mode
calVersion	HIFI_CAL_8_0		HIFI calibration version
Band	16		Active band

Data

obs

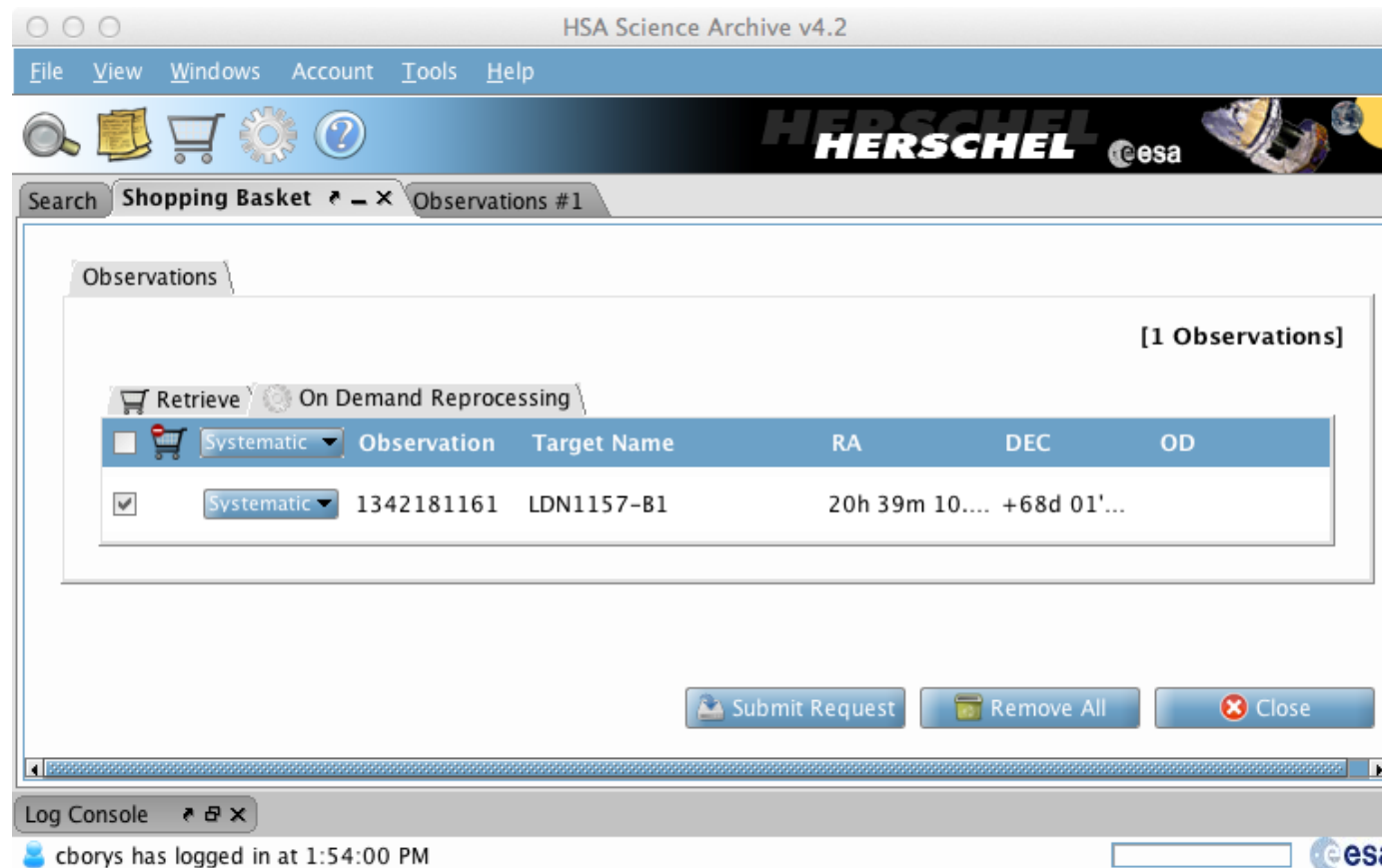
History

- Updates to the HIFI calibration data are generally concu between major releases of the software as the software calibration versions available since HIPE 5 are listed in

Calibration version number	Release date	OD	HIPE version	Change
IA_CAL_USER_ or HIFI_CAL_	dd-mm-yy			
2_0	29-11-10		5.0	Beam
3_0	11-01-11		5.1	Beam
4_0	18-02-11	645		Spur ta
5_0	13-04-11		6.1	Smooth
6_0	21-06-11	779		Sideba
7_0	12-12-11		8.0	Prever
8_0	03-02-12	995	8.1	Quality
9_0	24-07-12		9.0	Sideba house

- Use HSA web page or via HIPE:

**Window->Show View->Data Access-> HSA**



The screenshot shows the HSA Science Archive v4.2 web interface. The main content area displays a table of observations under the 'Observations' tab. The table has columns for 'Observation', 'Target Name', 'RA', 'DEC', and 'OD'. One observation is listed with the ID 1342181161 and Target Name LDN1157-B1. The 'OD' column contains the value '20h 39m 10.... +68d 01'...'. The 'On Demand Reprocessing' option is selected for this observation. Below the table are buttons for 'Submit Request', 'Remove All', and 'Close'. The interface also includes a 'Shopping Basket' and 'Log Console' section at the bottom.

Observation	Target Name	RA	DEC	OD
<input checked="" type="checkbox"/> Systematic	1342181161	LDN1157-B1	20h 39m 10....	+68d 01'...



## Other reasons to re-pipeline



- Two other major reasons for re-pipelining are to tweak the parameters of the existing pipeline, or to include optional pipeline steps.
- The On-demand reprocessing cannot accommodate these, and thus one must use HIPE.
- The configurable pipeline is particularly useful for getting access to all aspects of the pipeline







# HiFi pipeline command line use



- Two other major reasons for re-pipelining are to tweak the parameters of the existing pipeline, or to include optional pipeline steps.
- The On-demand reprocessing cannot accommodate these, and thus one must use HIPE.
- The following demo includes a script called `'hifi_pipeline_demo.py'` which contains more advanced examples, but in its simplest form, the pipeline is run via:

```
obs_new = hifiPipeline(obs=obs)
```

- The pipeline **OVERWRITES** the observation context, which is passed via reference. Thus **obs** is identical in content to **obs\_new** after running the pipeline. For this reason, I recommend simply:

```
hifiPipeline(obs=obs)
```



## HIFI GUI use



- The HIFI pipeline GUI is a great way to ‘learn’ about the pipeline. It generates a command line version of what the GUI executes, so you can easily cut and paste it into a script.
- Due to how TASKS work in HIPE however, the GUI always returns a new variable. i.e obs1, obs2 ,etc. Remember that all of these variables have the same contents because the pipeline overwrites data.
- Main advantage of the GUI is to tweak parameters of existing tasks, or to include (or exclude) other tasks.



# HiFi Configurable Pipeline



- The user has the option to add additional steps to the pipeline post level 2.
- Compatible tasks include **FitHiFiFringe**, **FitBaseline**, and **doDeconvolution**.
- You can also write custom scripts that the pipeline can use (more advanced topic)