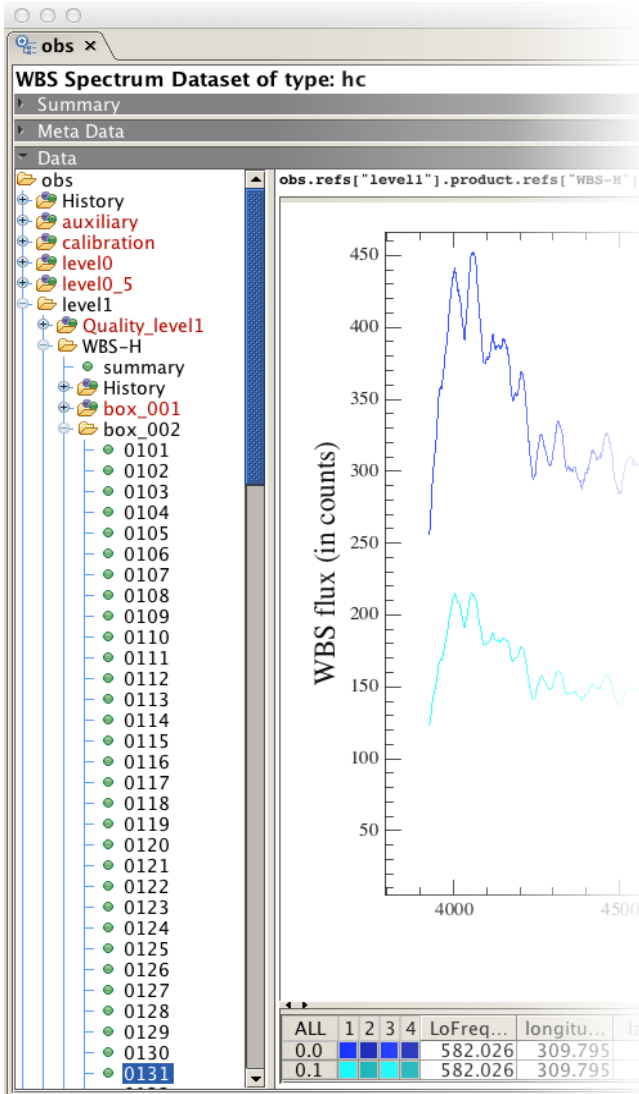




A Tour of HIFI Data





Outline



- Opening the observation context
- A casual look at the HIPE GUI presentation of your data
- How to plot the spectra with HIPE.
- Glossary of HIPE terms
- Tour of the *HiFi Timeline Product*
- Quick look at the 'science' result (level 2.5)
- The HISTORY section.
- The AUXILIARY section
- The CALIBRATION section
- The QUALITY section
- The Trend Analysis section



Opening the observation context



Within HIPE, open and run the 'tour_of_hifi_data.py' script.

Alternatively you can type the following in your console:

```
obs=getObservation("1342190183",\  
    poolName="1342190183_hipe90")
```

★ TIP: the '\ ' in the above lets you type long commands in HIPE by spanning them over a several lines.



The HIPE GUI and your data



- The HIPE display for an observation context is a lot like a graphical file system listing. In this analogy, directories are what we call ‘Products’, and the files in directories called ‘datasets’.
- Products can contain other products, just like a directory can have subdirectories.
- The GUI is broken up into a tree listing (side), a summary/meta data description (top), and a dataset display tool (right)
- Used properly, the GUI can be very powerful in letting you navigate and assess the quality and content of your data.



HIFI Glossary



- There is a lot of terminology associated with Herschel DP.

<i>Term</i>	<i>Description</i>
Observation Context	There is one context per observation. In our files-system analogy, it would be the 'root directory'. Everything needed to reduce the observation is contained within.
Product	A more specialized 'directory'. Examples include 'pointing product', or 'calibration product'. These group datasets of a similar theme.
Dataset	These are the 'files', and contain the information the instrument collected. For HiFi, the most common dataset is the spectrum.
Meta-data	Contexts, products, and datasets all hold meta-data which describe their contents. These can be thought of as the equivalent of a .fits header.
HIFI TIMELINE PRODUCT	A special container that stores all the spectra from a single HiFi backend.
Summary Table	Within an HTP, this table provides an index of the data in the order it was collected on the telescope.
Box	A product within an HTP that stores up to 100 datasets.



Tour of a HIFI HTP



- The HIFI Timeline Product (HTP) is a special product
- There are up to 4 HTPs at levels 0-1. One for each of WBS-H, WBS-V, HRS-H, and HRS-V. Some observations won't have HRS.
- At level 2, each HTP is split further into USB and LSB.
- The HTP stores datasets in the order they were taken on the telescope.
- At level 0, all data is included. By level 2, the calibration data is stripped away leaving only the calibrated science spectra.
- **The best way to examine the order is via the SUMMARY TABLE.**
- The BBID indicates what type of observation is being done.
- The 'isLine' flag is TRUE when the primary beam is on target.
- isHRS and isWBS indicate when those backends are collecting data
- 'length' tells you how many spectra were obtained for that cycle.



HISTORY SECTION



- Most users will not use this section. It contains an accounting of what tasks were run to process the data, and what the parameters were.
- In general the tasks are always going to be 'xxxPipeline'



AUXILIARY Section



- This section contains an abundance of pointing information, and in general is far beyond what users need to worry about.
- The 'EventsLogProduct' contains a listings of anomalies that were flagged during the time your data was taken. In general there will be a lot of them, and can be safely ignored.
- One section that users may refer to more often is the 'UplinkProduct', which contains details from your proposal and AOR settings.



The CALIBRATION Section



- This section contains a set of static tables stored at the HSA, as well as calibration related information determined during processing of the data.
- Sideband gains, the efficiencies, and so on are stored in the DOWNLINK part of the table. The user, if they so wish, can modify these tables manually and repipeline their data using the new values.
- A list of bad pixels, Tsys measurements from the loads, etc, are stored in the PIPELINE-OUT section. Changes made here will, in general, get overwritten if the user repipelines their data.



The QUALITY Section



- Although the tree stores a lot of information (much of which is admittedly opaque to the general user), the topmost level summary is the best way to quickly assess your data
- Critical items will be highlighted in color, though in most cases the quality section is populated mainly with warning messages that can be safely ignored.



The TREND ANALYSIS Section



- Everything in this section is derived from measurements of the data in the current observation context.
- It stores the fits to the comb observations (frequency calibration), estimates of the Tsys based on the load observations, and also a table of spurs or other spectral anomalies found in the data (more on this in the SPUR presentation).

