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DOCUMENT

HIFI Uncertainty Table Data Products: Release notes

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1 INTRODUCTION

This release note describes the content of the Data Product archive compiling all HIFI Flux Calibration Uncertainty Tables. Although the generation of these products does not intrinsically involve any particular processing step on top of what the standard product generation offers in the Herschel Science Archive (HSA), this archive is provided in the framework of Highly-Processed Data Products (HPDP).

2 DESCRIPTION OF THE HPDP

2.1 Scope and method for the product generation

At the end of the HIFI data processing pipeline, a frequency-dependent flux calibration uncertainty budget is computed and stored into dedicated calibration tables. Details about the content of these tables are given in Section 9 of the HIFI Data Reduction Guide (http://herschel.esac.esa.int/hcss-doc-15.0/load/hifi_um/html/hifi_uncertainty_table.html). Basically, one table is provided per Local-Oscillator (LO) frequency tuning, per spectrometer (HRS, WBS), polarization (H, V) and per sideband (USB and LSB). For Single Point and Mapping Mode observations, only one LO tuning applies, while for Spectral Scan observations there will be different tables at every individual tuning used in the spectral survey.

Because those tables are provided deep down inside the Observation Context, they are not readily available when downloading top-level products (typically the level 2.5 for HIFI). Yet, the tables provide an estimate of the flux calibration uncertainty applying to the data and are therefore important information to use in combination with the data themselves. How to interpret those tables in terms of scientific exploitation of the HIFI data is described in Section 5.8.1 of the HIFI Handbook (<http://www.cosmos.esa.int/web/herschel/legacy-documentation-hifi>).

The products distributed through the archive described here are simply extracted from the standard pipeline products generated with HIPE 14.1, and bundled together in a stand-alone fashion.



2.2 Content of the HPDP

2.2.1 Deliverable format and structure

The current delivery for this HPDP contemplates 9602 HIFI observations, out of which 7656 are Single Point Mode observations, 1445 are Mapping mode observations, and 501 are Spectral Scan observations. These concern essentially all non-FAILED HIFI observations, belonging both to the Science and Calibration programmes. The file content of this archive is as follows:

- The complete archive comes as a collection of gzipped tarballs associated to each ObsID, and called `<obsid>_UncertaintyTables.tar.gz`.
- Each tarball contains a collection of gzipped FITS files containing the individual tables, and named `<obsid>_<sp>-<pol>-<sb>_UncertaintyTables.fits.gz` where `<sp>` is WBS or HRS, `<pol>` is either H or V, and `<sb>` is either USB or LSB.
- Note that these products do not come with any dedicated postcard.

Figure 1 illustrates a typical table dataset content for a given spectrometer, polarization and sideband, as displayed in HIPE.

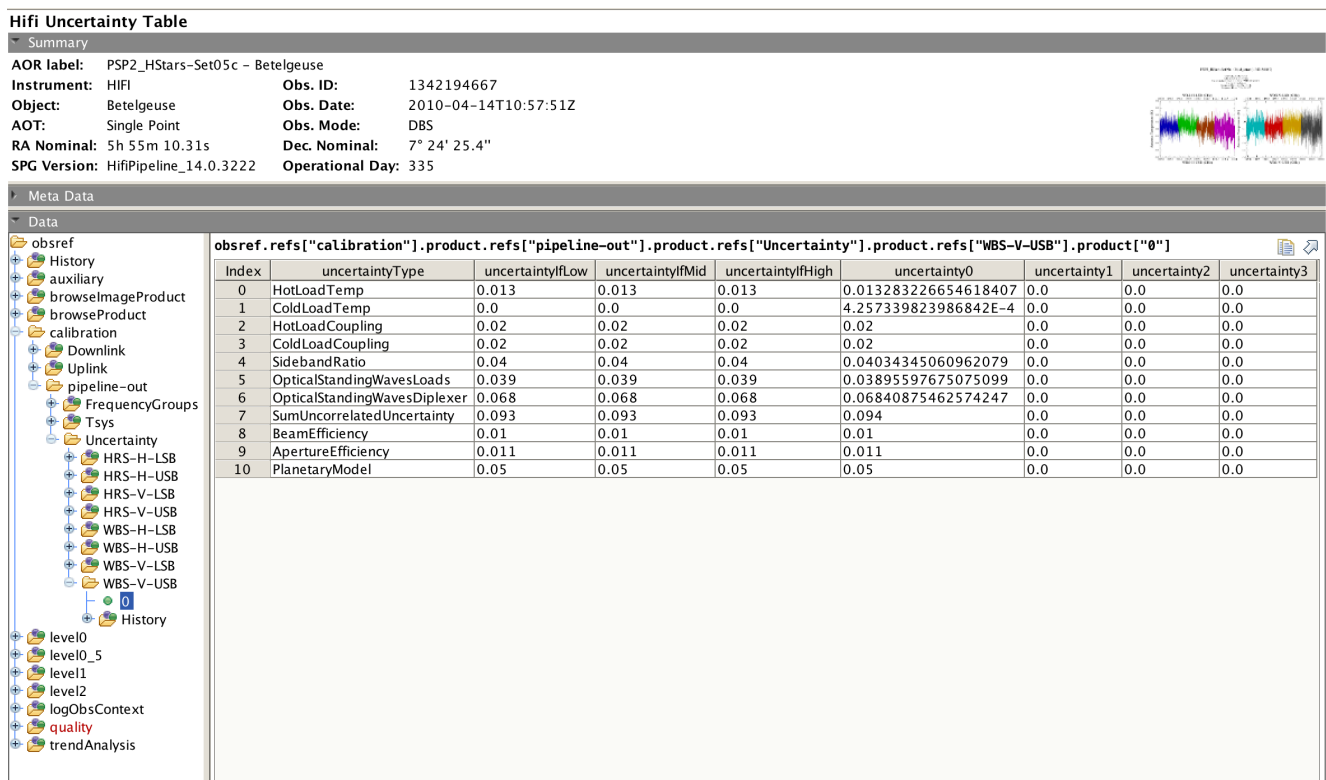


Figure 1: Illustration of the content of the Uncertainty Table of the WBS-V-USB data for ObsID 1342194667, visualized in the Observation Context of this observation within HIPE



The individual tarball size will depend mostly on the type of observations: Single tuning observations will imply compressed archives of ~25 to 60 Kb, depending on which spectrometer and/or polarisations are present or not; Spectral Scan observations will offer archives as big as ~240 Kb for the largest number of tunings. The total (compressed) size of the HPDP is 619 Gb.

2.2.2 HIFI Uncertainty table data product queries in the HSA

The HIFI Uncertainty Table Data Products can be retrieved through the HSA like any other HPDP, namely either as a full download, or following the results of a filtered query. Alternatively, they can also be fetched in the Herschel Science Centre web portal – see <http://www.cosmos.esa.int/web/herschel/highly-processed-data-products>. Finally, because those tables are part of the overall Calibration Context, they can also be fetched by downloading the full Calibration Context, using the “Retrieve Products” menu of the HSA.