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DOCUMENT

HIFI Non-Averaged Level 2 products for Point Mode Observations: Release notes

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CHANGE LOG

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First version of document	1	0	16 March 2016
Update to reflect 31 more obsids being treated	1	1	1 June 2016

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1   INTRODUCTION

This User-Provided Data Product (UPDP) contains the non-averaged level 2 spectra for all successful HIFI Point Mode observations. They are provided for all available spectrometer and sideband available in a given observation in the form of FITS files containing so-called HIFI Timeline Products. Such products are particularly relevant in case users would like to make their own assessment of which data might or might not be eligible for averaging into the final collapse of individual spectra.

2   DESCRIPTION OF THE UPDP

2.1   Scope and method for the product generation

At the end of the level 2 pipeline of the HIFI standard product generation, an averaging of all individual spectra taken at a given identical Local Oscillator frequency tuning is performed for each spectrometer and sideband present in the data. Spectra are combined taking into account possible flagging, which will discard data previously masked by the pipeline wherever applies. These masks, however, will not always fully reflect which of the individual spectra may have been taken under non-optimal instrument conditions, and so potentially under-performing data may end up in the averaged data. The purpose of this product archive is to allow users to inspect individual level 2 spectra prior to their averaging, without having to re-run the corresponding pipeline steps.

The non-averaged spectra are simply obtained by skipping the pipeline task dedicated to the spectra averaging at the end of the level 2 processing. An example of how this is done is given in Section 5.4.2 of the HIFI Data Reduction Guide (http://herschel.esac.esa.int/hcss-doc-14.0/index.jsp#hifi_um:hifi-um).

The distributed products are similar to other level 2 spectra, i.e. they are calibrated in a T_A^* Single Sideband intensity scale, and provided both on an Upper and Lower Sideband frequency scale. Unlike the standalone browse products provided by the Archive for Point Mode observations (which correspond to level 2.5 products), the level 2 data are un-stitched. Similarly, for Frequency Switching observations, the level 2 data are non-folded. Further details about the difference between the HIFI level 2 and level 2.5 products can be found in Section 3 of the HIFI Data Reduction Guide, as well as in the HIFI Handbook (http://www.cosmos.esa.int/web/herschel/legacy-documentation-hifi).

2.2   Content of the UPDP

2.2.1   Deliverable format and structure

The current delivery for this UPDP contemplates 7654 HIFI Point Mode observations. The complete archive, named HIFI_NonAvgLevel2.tar.gz, comes as a collection of gzipped tarballs associated to each ObsID, and called <obsid>_nonAverageLevel2.tar.gz. Each tarball contains the following:

- A postcard <obsid>_Postcard_nonAvgL2.png illustrating the collection of all individual WBS spectra present in the tarball. This postcard uses the same format as that of the standard Point Mode browse products
- A series of FITS files containing the HIFI timeline products for each spectrometer (WBS or HRS), polarization (H or V) and sideband (USB or LSB). The file names are: <obsid>_<spectrometer>_<polar>_<sideband>_nonAvgL2.fits.gz

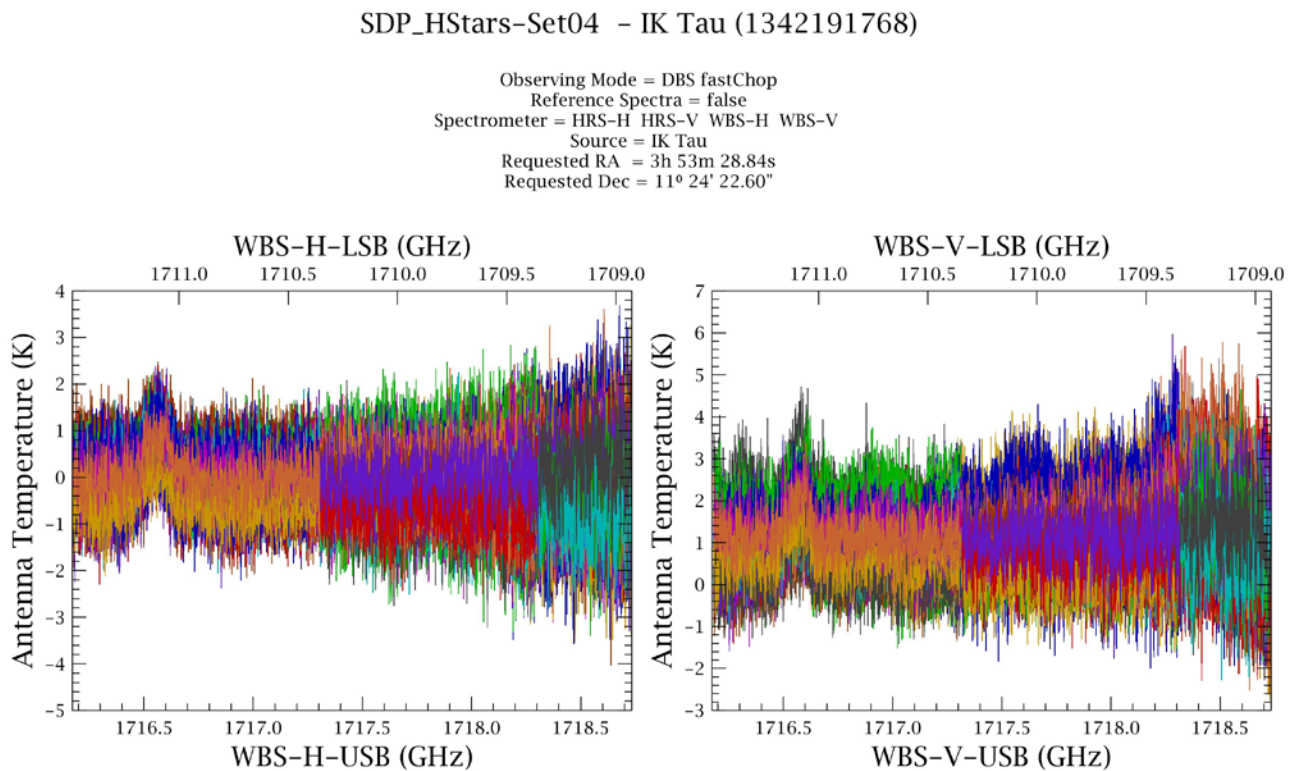Figure 1 illustrates a typical postcard for such a product.

Figure 1: Postcard of the non-averaged level 2 spectra of ObsID 1342191768. All individual sub-bands appear as segments of a different colour.

The tarball size will depend on the observation length, i.e. on how many individual level 2 spectra were acquired in the course of the observation. The HIFI Point Mode observation duration ranges between ~50 sec and ~54,000 sec. The corresponding (compressed) tarball sizes for these two extremes are ~1.5 Mb and ~4.16 Gb respectively. The total (compressed) size of the UPDP is 334 Gb.

2.2.2   Non-Averaged level 2 product queries in the HSA

The non-Averaged level 2 data products can be retrieved through the HSA like any other UPDP, 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 portal – see http://www.cosmos.esa.int/web/herschel/user-provided-data-products.