



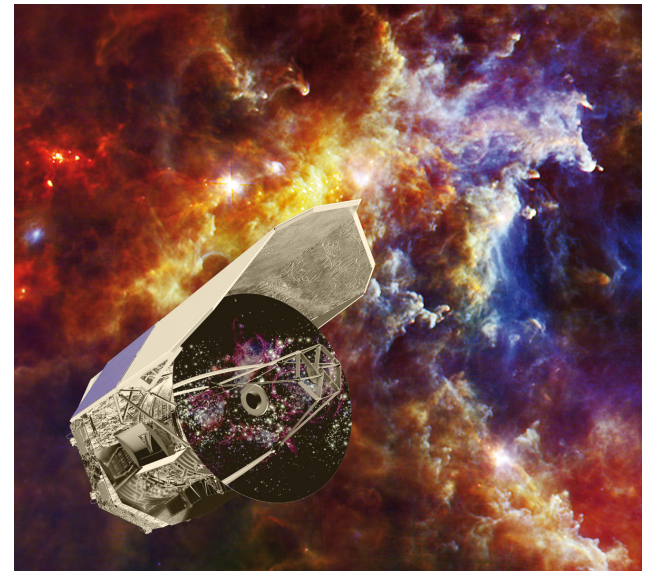
*Photodetector Array Camera and Spectrometer:*  
*Photometer: Data Access and Products*

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## Two Topics

- I. Accessing PACS data
- II. Photometer Products





# Accessing PACS photometer data



## Introductory Notes

- 1) PACS data may be accessed and viewed via many different and independent methods.
- 2) For data processing and analysis within HIPE, one convenient method is ‘**getObservation**’, which uses the HIPE command line interface.
- 3) Access to data is provided via the unique observation identifier (**OBSID**).

Relevant Section in HIPE 11 documentation

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### 1.2.2. Getting your data from the archive into HIPE

There are a number of ways to get Herschel data into HIPE, and those data can come in a number of ways, but here we give an overview of the simplest ways to get Herschel data into HIPE. Herschel data are stored in ESA's Herschel Science Archive (HSA),

- They are identified with a unique number known as the Observation ID (obsid)
- HIPE expects the data to be in the form of a **pool**, so HSA data must be *imported* into HIPE
- A **pool** is like a database, with observations organised as an **Observation Container**, partially-, and fully-reduced data products

There are several ways to get observations imported from the HSA, or disk, into HIPE:

- Directly from the HIPE command line, using

```
obsid = 134..... # enter your own obsid
# to load into HIPE:
myobs = getObservation(obsid, useHsa=True)
# to load into HIPE and at the same time to save to disk:
myobs = getObservation(obsid, useHsa=True, save=True)

# You must be logged on to the HSA for this to work:
# See the DAG sec. 1.4.5.
```

See the DAG [sec. 1.4.5](#) for more information on getObservation (for example, how to use getObservation then the data are at the same time saved to disk to your MyHSA: r provided in [sec. 1.4.5](#)).

This method is useful for single observations and brings the data directly into HIPE.

- Download a tar file (which is not a pool) from the HSA. See the DAG [sec. 1.4.7](#) for more information on how to do this.

If you are getting a tarfile, then you will have gone into the HSA, identified your observation, and imported the data into HIPE. This is explained in the DAG [sec. 1.5](#); to summarise, after

```
# Get the data from the HSA as a tarball
# On disk, untar the tarball, e.g.
cd /Users/me/fromHSA
tar xvf memel342.tar

# in HIPE, then
```

# get data via 'getObservation'

Define your observation

The command in its most basic form.

```
1 ▶
2 # Define OBSID
3
4 obsid = 1342185553
5
6 # Access the observations from Herschel Science Archive
7 #
8 # obsid = Your observation identifier
9 # useHsa = True/False means obtain from local disk or the Science Archive
10 # instrument = 'PACS' is only needed for parallel mode observations.
11
12 obs = getObservation(obsid,useHsa=True,instrument='PACS')
13
14
```

Script name: "Example-accessSingleOBSID.py"



## What just happened?

- In fact, you have only established a link to the data.
- The variable ‘obs’ is called the ‘**observation context**’ of your observation.
- Access to actual data is proceeds via further manipulation of the observation context.
- We will discuss ‘obs’ in later slides.

## Saving your data.

The command to use is **'saveObservation'**

Define location

```
14 # You probably wish to save the accessed data.
15
16 # First define where:
17
18 poolDirectory = "/herscheldata/pacs/babar/"
19
20 saveObservation(obs,poolLocation=poolDirectory)
21
22
23
24
```

And, save all data associated with the observation context.

Script name: *"Example-access-and-save-SingleOBSID.py"*





# Access & Saving Multiple OBSIDs

```
1 ▶
2  # Define OBSIDs in a python array
3
4  obsids = [1342185553,1342185554]
5
6  # EDIT and Define where you wish to save the data.
7
8  poolDirectory = "/herscheldata/pacs/babar/"
9
10 # Loop through each obsid to save the data.
11
12 for obsid in obsids:
13     print "Starting OBSID=%i ..." % (obsid)
14     obs = getObservation(obsid,useHsa=True,instrument='PACS')
15     saveObservation(obs,poolLocation=poolDirectory)
16     print "... finished"
17
18
```

Script name: *“Example-access-and-save-MultipleOBSIDs.py”*



NHSC/PACS team has prepared a dedicated tutorial on how to access and download PACS data in HIPE:

<https://nhscsci.ipac.caltech.edu/sc/index.php/Pacs/DataProcessing>

Main NHSC Page

PACS

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[Pacs /](#)  
**Data Processing**

**PA**

### I. Downloading data from the Herschel Science Archive

NHSC recommends that you use HIPE to directly access and save data from the saveObservation.  
The tutorial is linked here:

[PACS-103: Accessing and storing data from the Herschel Science Archive](#)

Here is an example script and related files:

- [getPACSdata.py script](#)
- [README file that describes how to use said script.](#)
- [Optional changes needed in the HCSS property file \(see README file\)](#)

Click on this link to download or view the tutorial

Scripts and additional info on configuring HIPE



# PACS photometer products



## First there is observation context

- The observation context is a pointer to all PACS data associated with a particular observation.
- Individual observations are identified via their identifiers (OBSIDs).
- Interactive processing starts by loading the observation context first.
- Data are pulled into HIPE for processing via the observation context.
- In HIPE observation context appears as a variable.
- All PACS processed data products are linked via the observation context.



## What are product levels?

- PACS pipelines save data at a few natural stopping points.
- The “level” in product level refers to the amount of processing applied to the raw signal.
- Higher levels imply more processing.
- The products at all levels are accessed in HIPE via the observation context link.



## PACS product levels

- **Level 0:** Raw signal values. Astrometry and housekeeping information is not merged.
- ~~**Level 0.5:** Basic reorganization of data and associating housekeeping and astrometry with the signal.~~
- **Level 1:** Calibrated cube of PACS bolometer readouts.
- **Level 2:** Projected maps.
- **Level 2.5:** Projected maps using two observations (scan and cross-scan).
- **Level 3.0:** Projected maps using all observations.

*In addition, there are ..*

- Auxilliary products, Housekeeping products and calibration products

# PACS data in HIPE

- You can use the GUI aspects of HIPE to navigate through PACS data products via the observation context.

Editor x

L25\_scanM...dited.py obs x

### ObservationContext for PACS data of observation 1342185553

Summary

Object:	rcw 120	Instrument:	PACS
RA:	17h 12m 23.1s	DEC:	-38° 27' 43"
Observation ID:	1342185553	Operational Day:	148
Observation Mode:	Scan map		

Meta Data

Data

- obs
  - auxiliary
  - level0
  - level0\_5
  - level1
  - level2
  - logObsContext
  - quality
  - qualitySummary

obs

# HIPE 11 documentation

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## 6.2.1. The ObservationContext

The first product you will work on is the *ObservationContext*. *ObservationContext* is a grand container of all the individual *ObservationContext* with the Observation viewer (see the