SpireMaskEditor

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Introduction

- ## Herschel
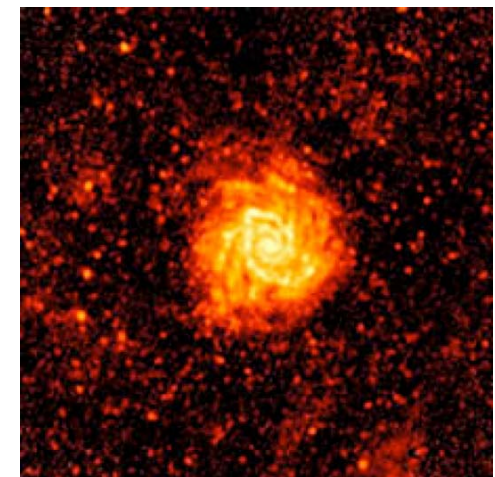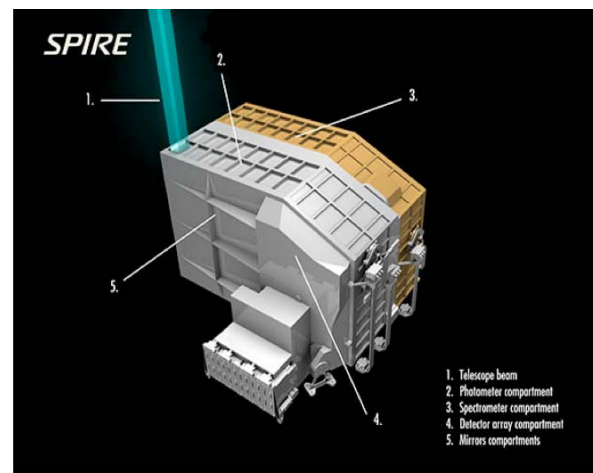 - Launched in 2009, 4th ESA Cornerstone mission
  - FIR/Submm (55 -672 μm) space facility
  - It has three instruments
    - **HIFI** – **H**eterodyne **I**nstrument for the **F**ar **I**nfrared
    - **PACS** – **P**hotodetector **A**rray **C**amera and **S**pectrometer
    - **SPIRE**– **S**pectral and **P**hotometric **I**maging **R**eceiver
- ## SPIRE
  - 3 bands centered at 250,350 and 500 um
  - imaging Fourier Transform Spectrometer(FTS) covering 200-670 μm
  - base scan mode

SPIRE

1. Telescope beam
2. Photometer compartment
3. Spectrometer compartment
4. Detector array compartment
5. Mirrors compartments

SPIRE Pipeline

Raw telemetry data (TMPacket) as measured by instrument

Assign unit on level0 product

Perform a series of data reduction procedures such as deglitching, temperature drift correction, flux conversion etc.

Image
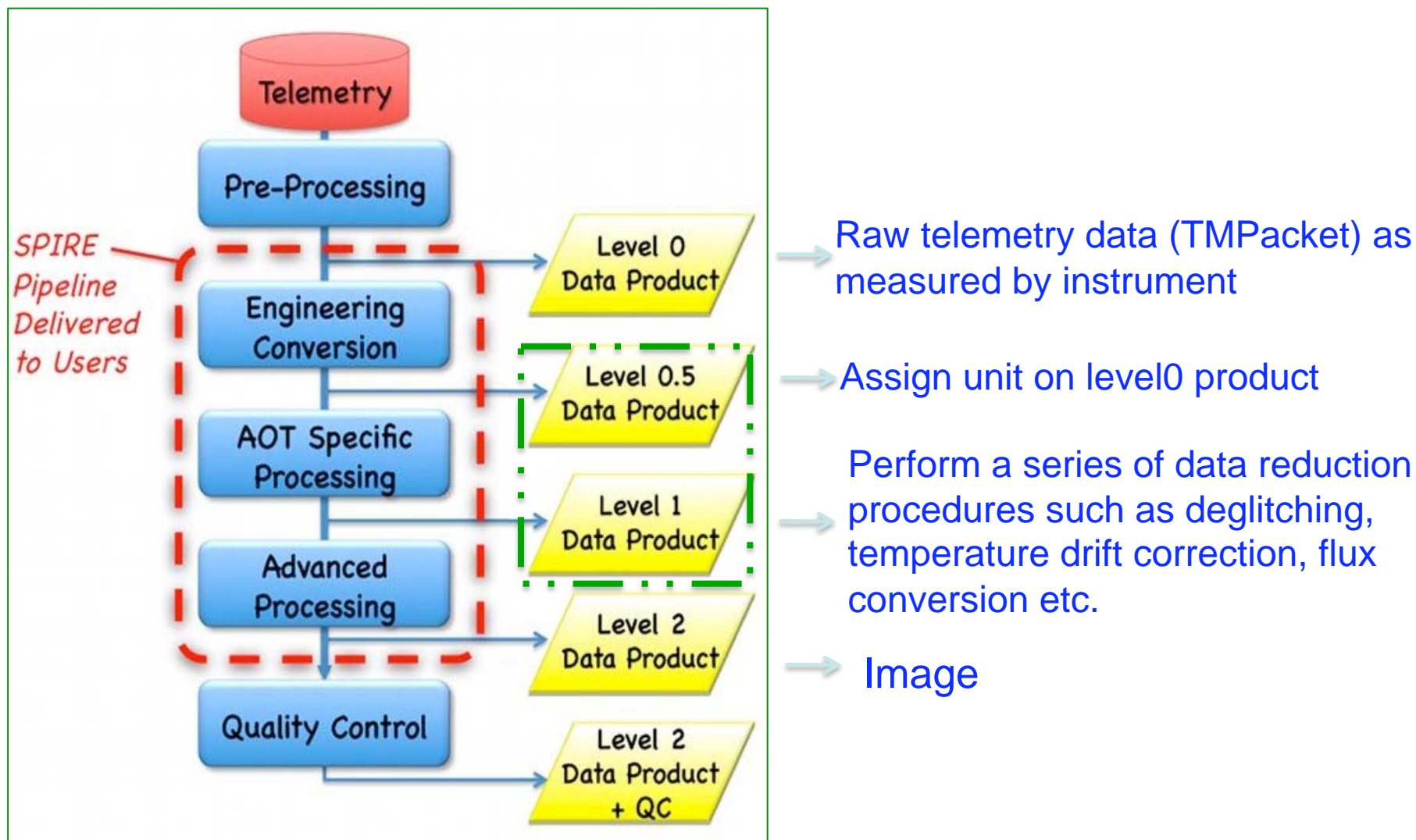
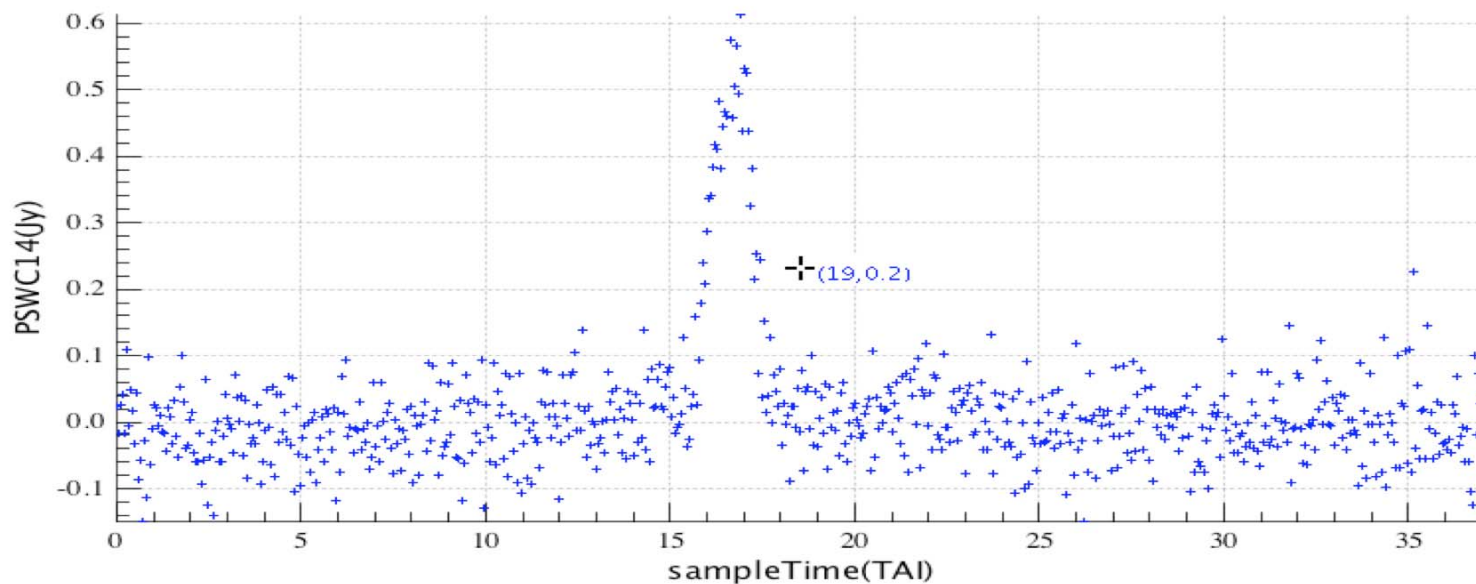# Level 1 Product

Level 1 – DetectorTimeline

◆mask – an integer array (32 bit)

◆signal

◆ra

◆dec

◆History

◆temperature

Each read out can be individually modified

SpireMaskEditor

- SpireMaskEditor
  - a GUI tool for viewing and editing mask (in level1 and level0_5)
  - accessible under Herschel Interactive Processing Environment (HIPE) (show later)
- How mask array relates to SpireMask?
  - each bit offset corresponding to one SpireMask flag
  - bit is unset (0) $\Longrightarrow$ normal condition
  - bit is set (1) $\Longrightarrow$ abnormal condition
  - by checking which bit is set/unset to determine which SpireMask is set/unset
- Examples

MASTER flag is defined as offset 0

bit expression	value	flag set/unset
00000000000000000000000000000000	0	unset
00000000000000000000000000000001	1	set

ADC_LATCH is defined as offset 4

00000000000000000000000000000000	0	unset
00000000000000000000000000001000	8	set

SpireMask and its Flags

SpireMask

- **the indicators** of a condition as it relates to the data.

- each bit offset represents a condition

-24 flags are defined currently and 16 flags are implemented:

MASTER
ISDEAD
INVALID_TIME
ADC_LATCH
VOLTAGE_BELOW_K3
NO_RESP_DATA
ISNOISY
ISNOCHOPSKY
VOLTAGE_OOL
ISSLOW
TSIGNAL_HDV
BSM_CHOP_OOL
BSM_JIGG_OOL
TRUNCATED
TRUNCATED_UNCORR.
GLITCH_FIRST_LEVEL
GLITCH_FIRST_LEVEL_UNCORR
GLITCH_SECOND_LEVEL
GLITCH_SECOND_LEVEL_UNCORR