Introduction to PACS photometry

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The PACS photometer

Two filled silicon bolometer arrays in dual band imaging:
- 64x32 pixels at 70 & 100µm
- 32x16 pixels at 160µm

2 bands simultaneously: 70+160 or 100+160

PSF FWHM: 5.2”, 7.7”, 12”
Pixel scales:
- 3.2” for blue and green
- 6.4” for red

⇒4 times better than previous IR missions, with fully sampled images provided in the archive, suitable for point and extended sources
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(Right) The area of uniform coverage is where the scan and cross-scan overlap completely.
Three AOTs were offered for routine science:
- standard scan cross-scan, with a user-defined sky coverage
- mini scan maps, designed for small field (usually point sources)
- SPIRE—PACS parallel scan maps, with the scanning speed and angles optimised for SPIRE

The raw data from the PACS photometer are data cubes:

The pipeline turns these time-line detector data-streams into maps (units of Jy/map-pixel), using three mappers:
- High-pass filtering and photProject (for point sources only)
- JScanam (any type of source)
- Unimap (any type of source)
Photometer calibration

The PACS photometer flux calibration is based on stellar and asteroid calibrators.

- **Accuracy**: 5%
  - 1% relative accuracy (repeatability)
  - 5% uncertainty of standard models
- **Linearity** up to 100 Jy (non-linearity corrections are part of the pipeline)
- **Saturation**: 300 – 1000 Jy

- PACS maps are **not** absolutely calibrated: the zero level is unknown and arbitrarily set by the mapmaker

- There is **no unique** standard PSF, as it depends on several factors (observing mode, scan angle, scan speed, data processing ...). PSF-based values (e.g. FWHM) and corrections (e.g. aperture corrections) are always given for different scan speeds and for the prime/parallel modes.