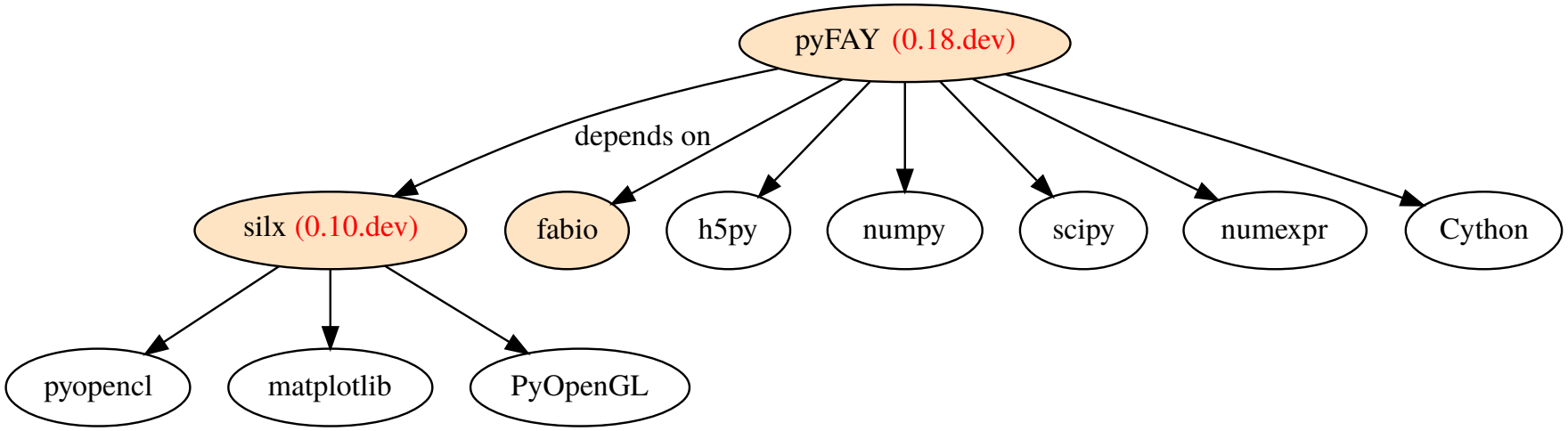

ESRF
The European Synchrotron

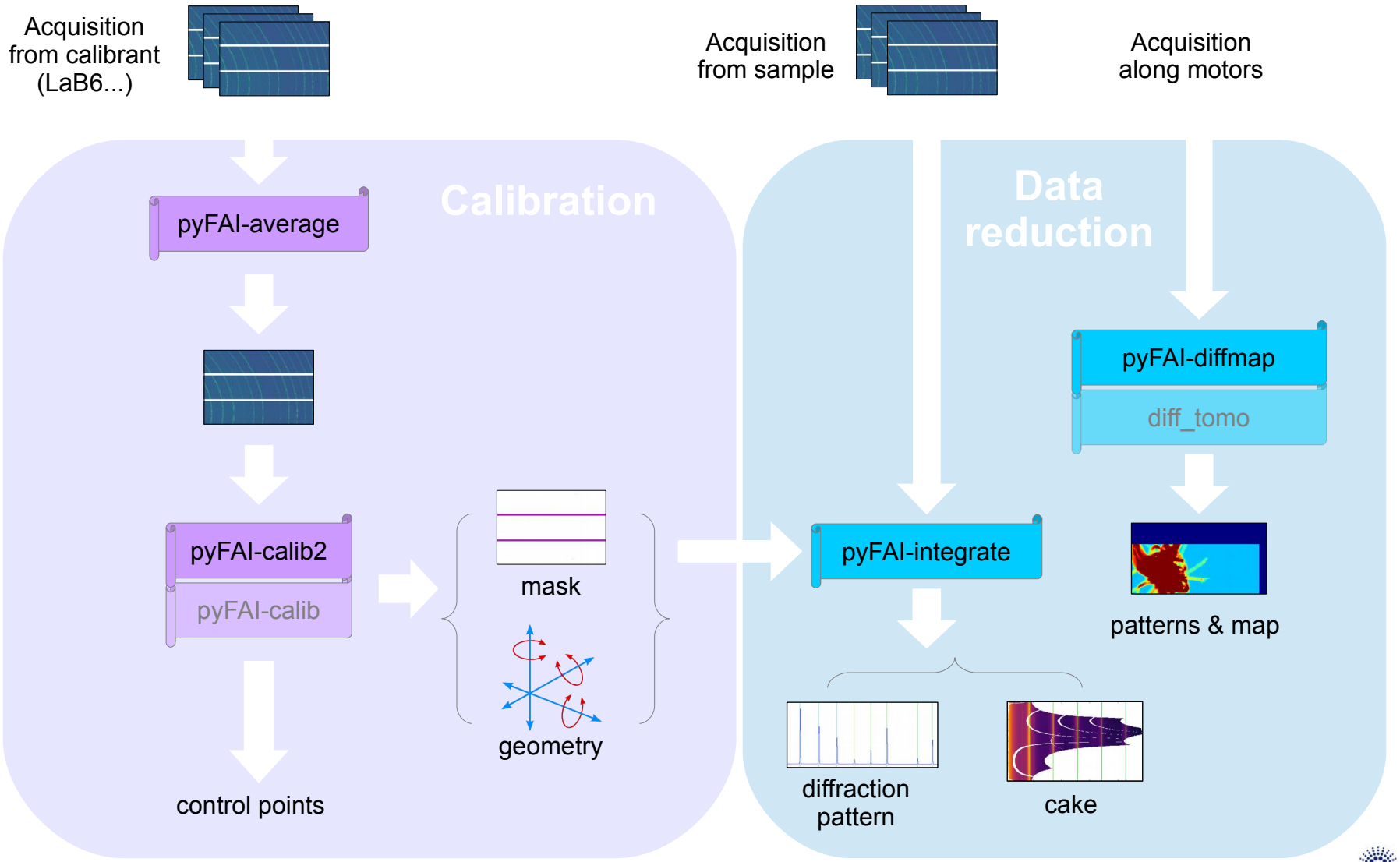
Applications in pyFAI

PyFAI distribution

- **Python software part of silx-kit**
- **Open source (MIT license)**
- **Release on https://pypi.org/ (pip install)**
- **Source code on https://github.com/silx-kit/**

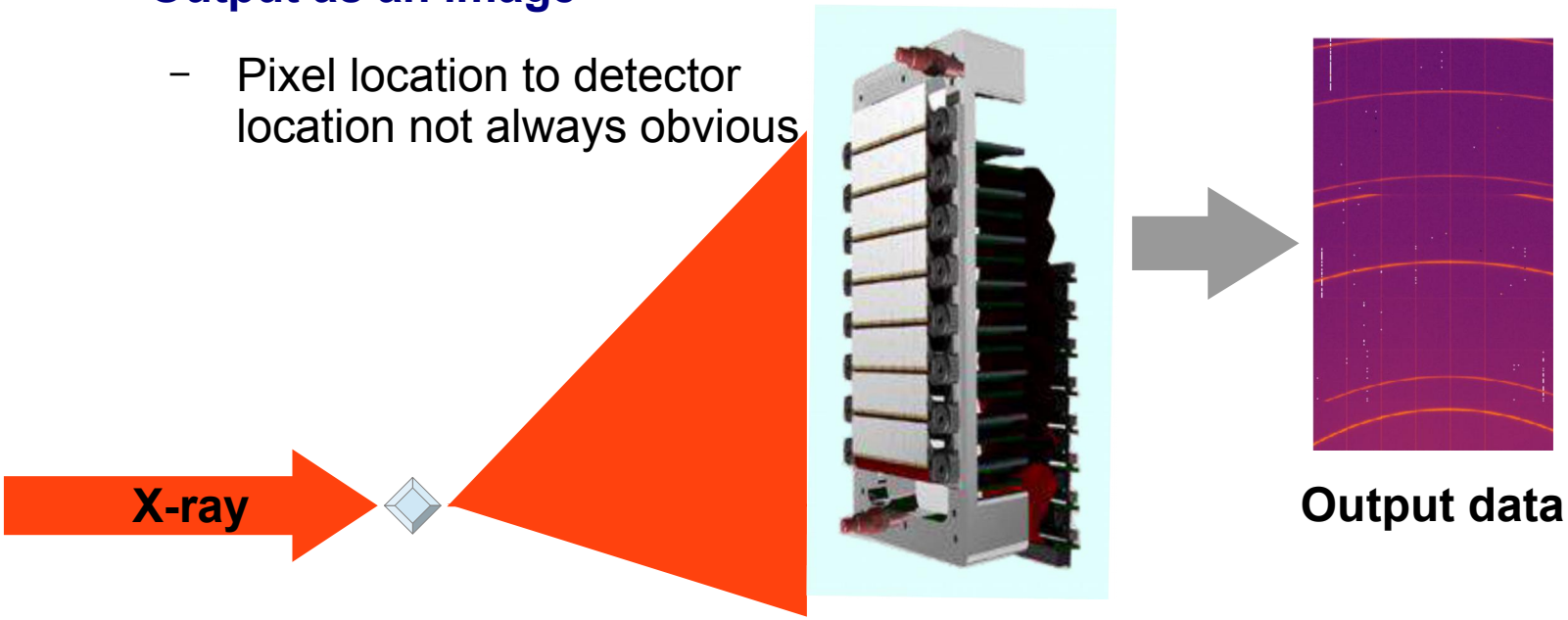


PyFAI applications overview



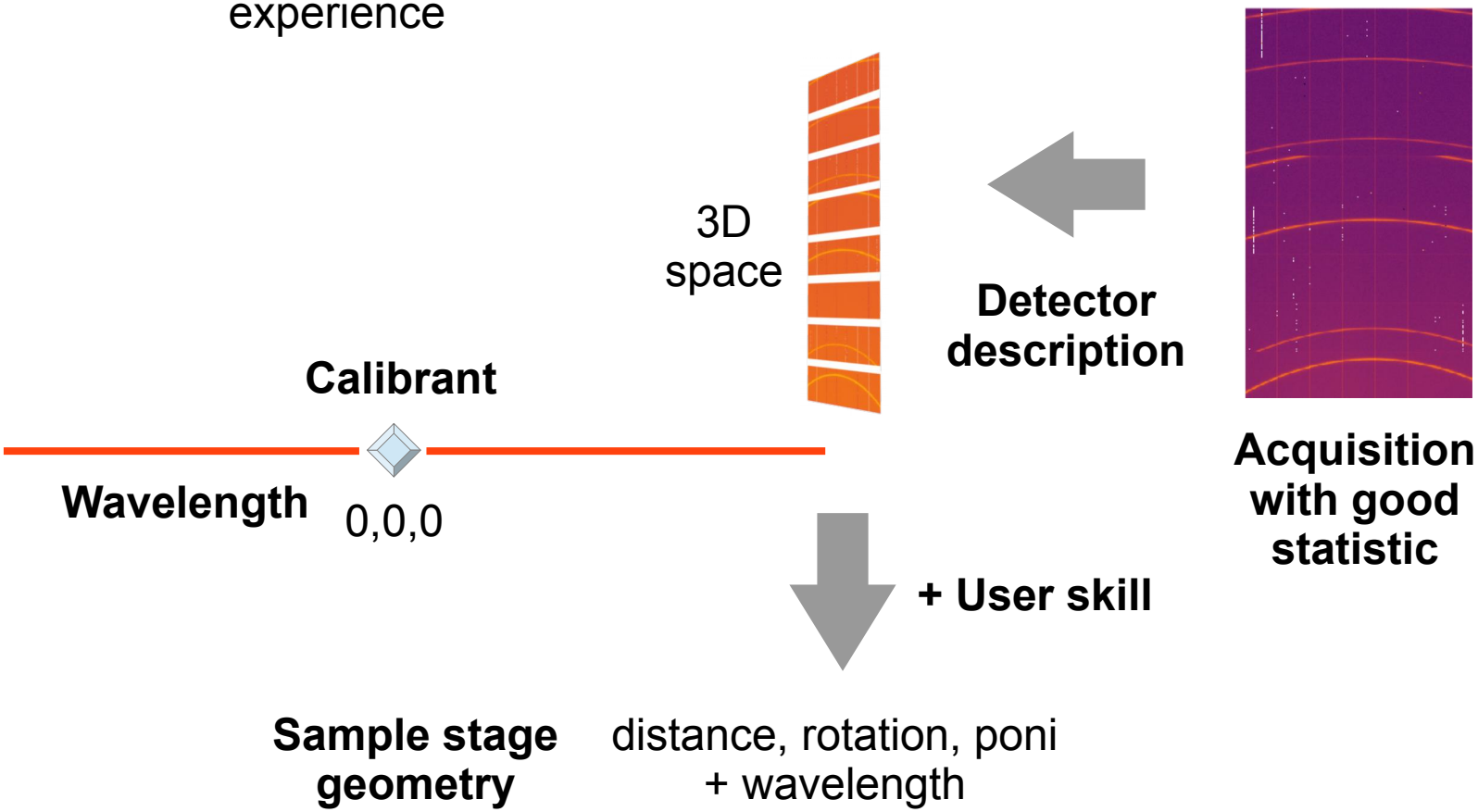
Usual sample stage

- **Detector count photons**
  - Location of the detector not always accurately known
- **Output as an image**
  - Pixel location to detector location not always obvious



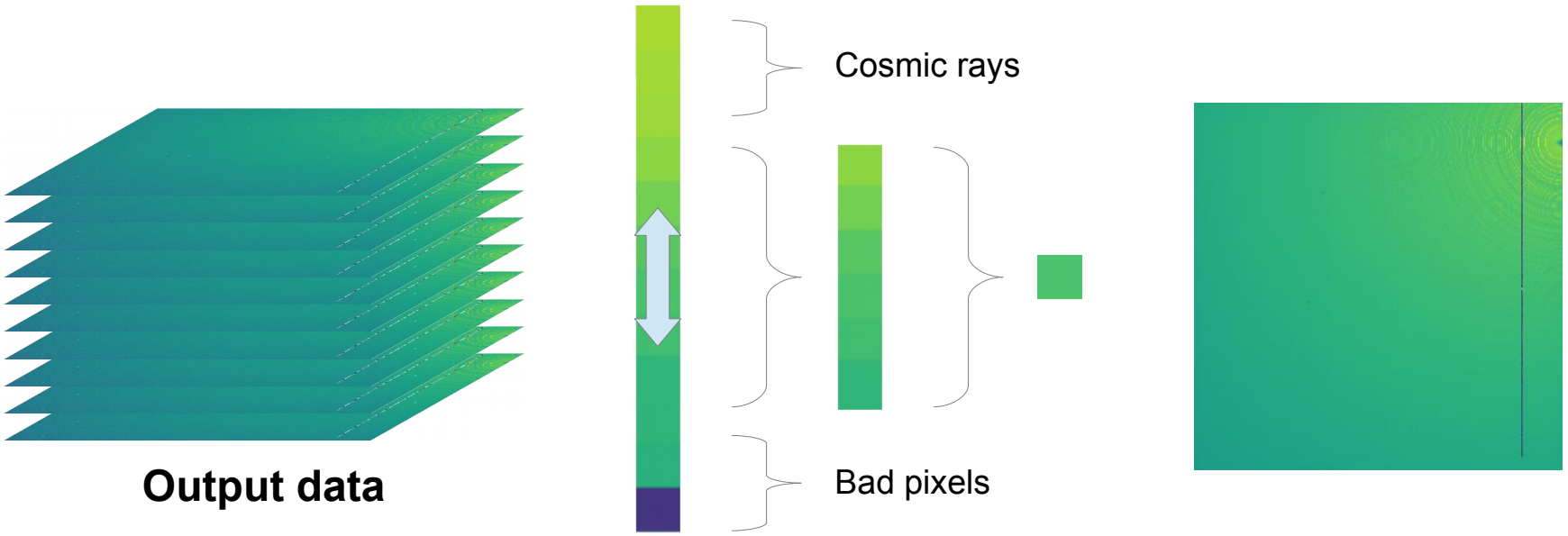
Calibration of the sample stage

- **Compute accurately sample stage geometry**
  - From calibrant acquisition
  - Information from the experience



Averaging detector output

- **Use input image with good statistic**
- **Could use pyFAI-average**
  - Provides some data reduction methods
  - Like quantile reduction

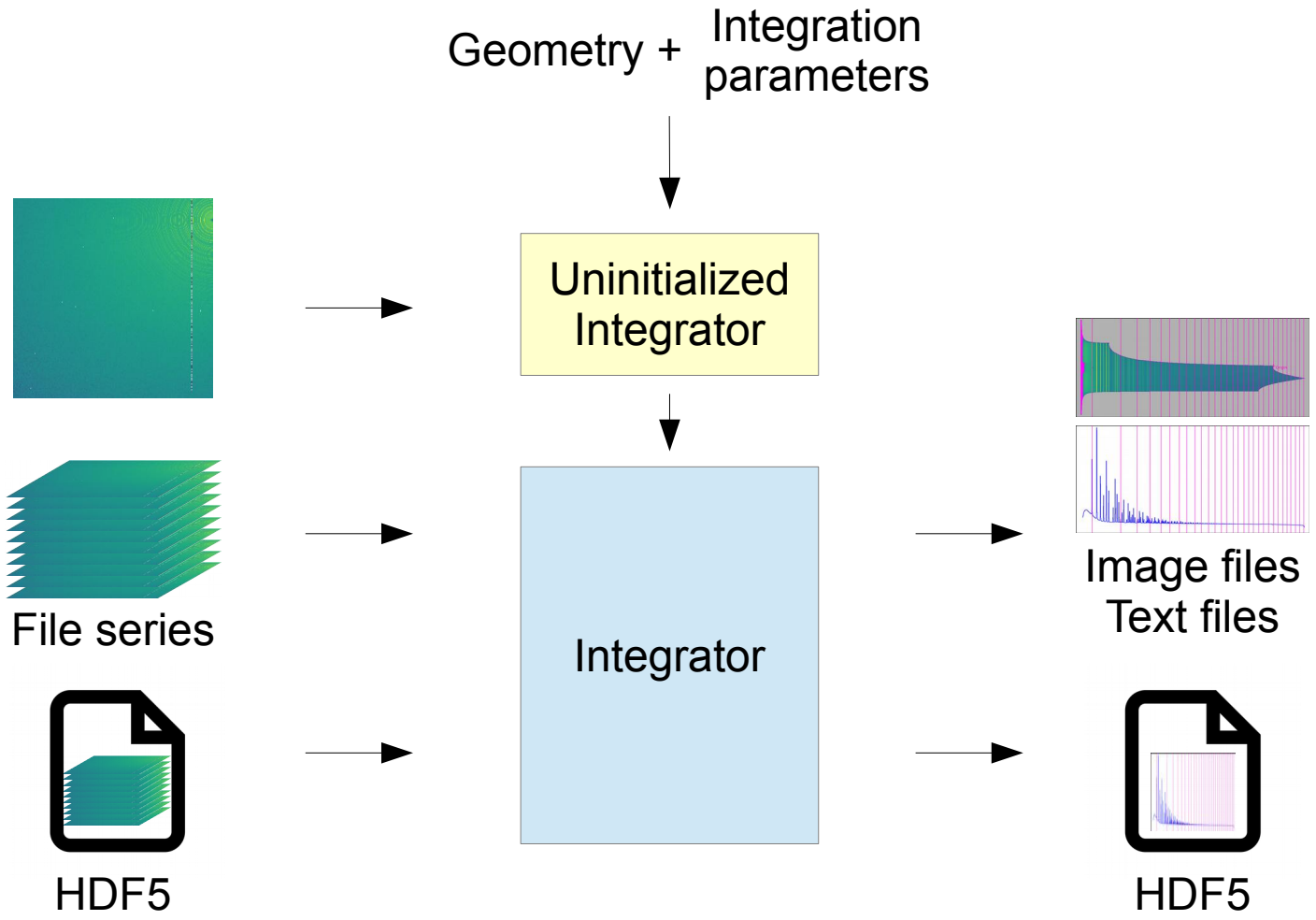


Hand's on

DEMO

Average + Calibration

Integration



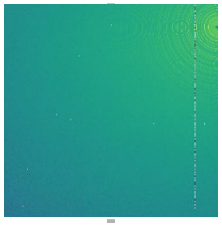
Improve data input

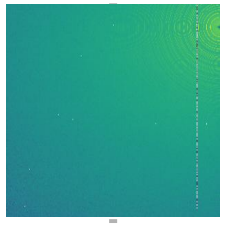
Networ
k
2 GB/s

Hard drive
2 GB/s

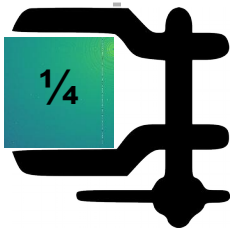
RAM
180 GB/s

Graphic card
10 GB/s





bitshuffle
+ lz4



Decompressed

CBF
format

Detector

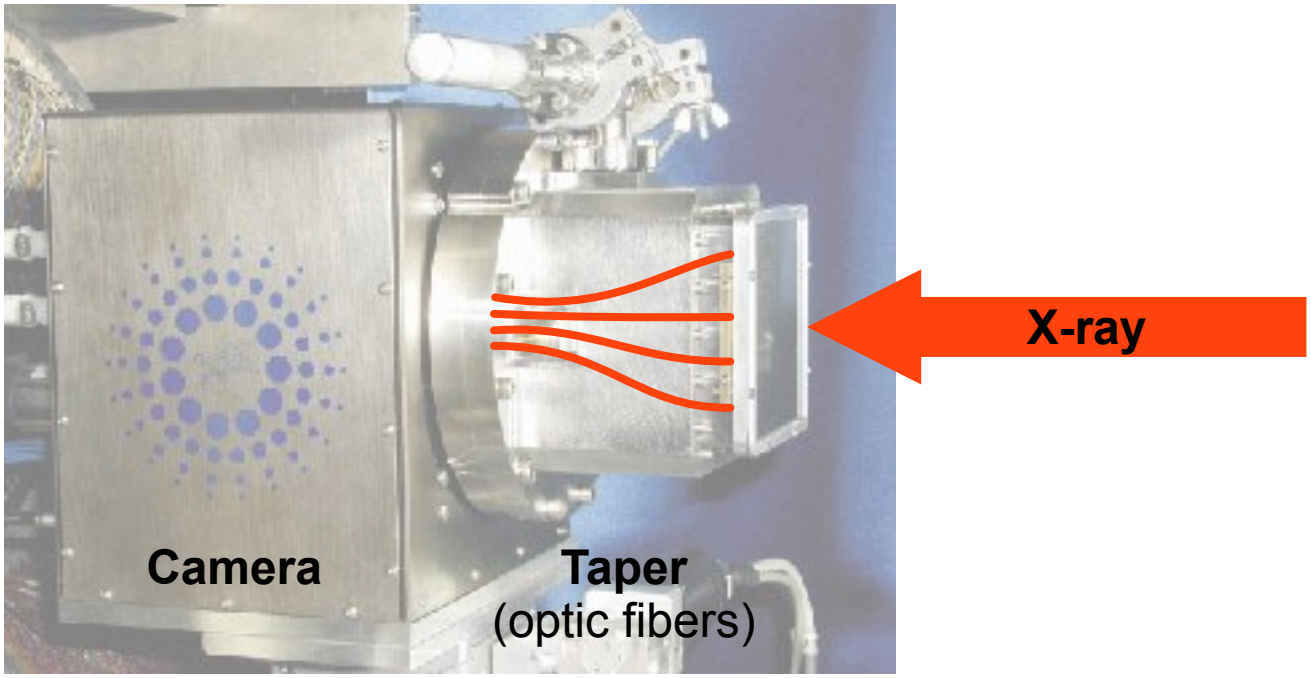
Hand's on

DEMO

Integration

Hand's on calibration

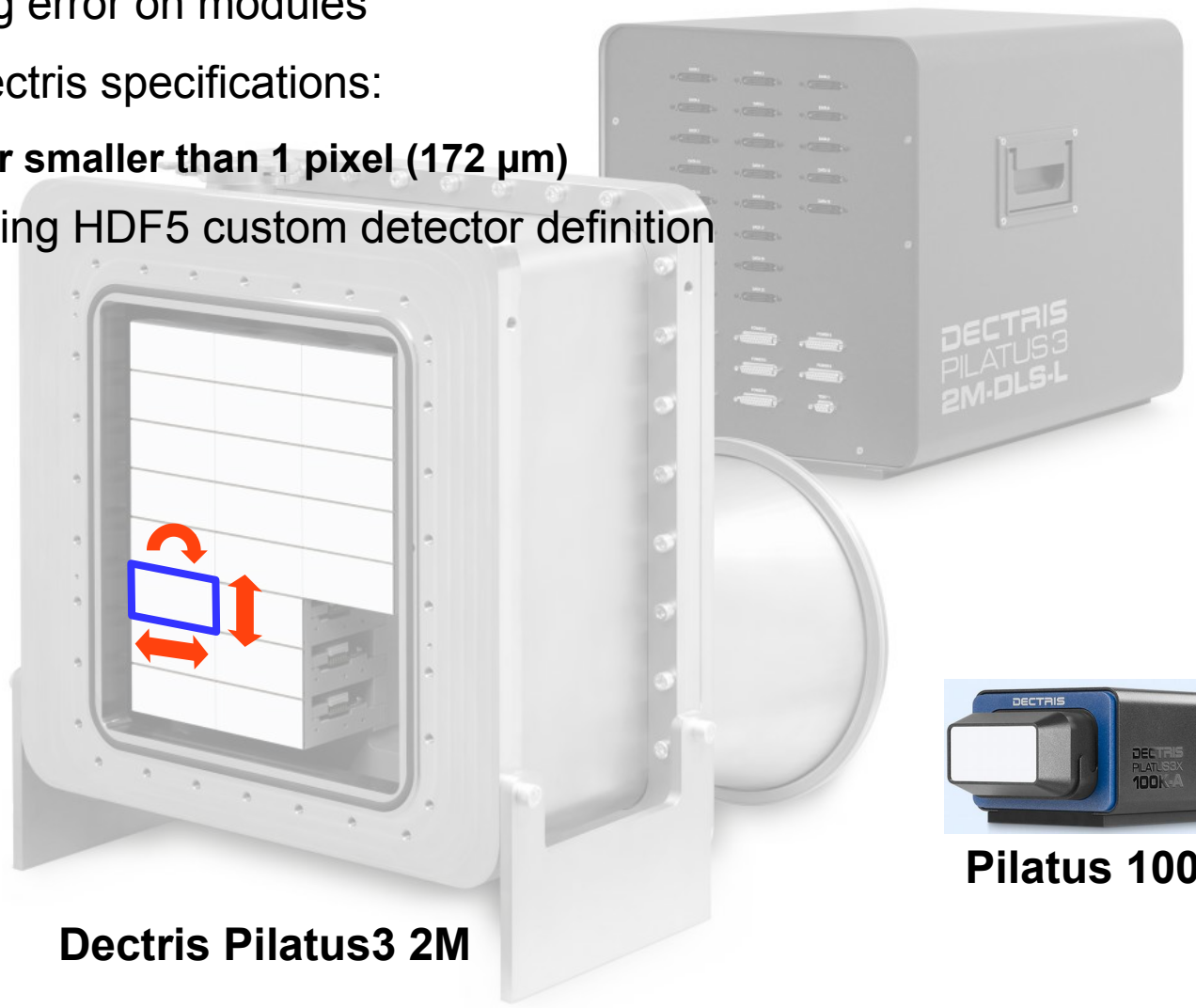
- **Taper detectors**
  - Taper manufacturing process create distortions
  - Correction done using spline files (Fit2D)



Frelon detector

Hand's on calibration

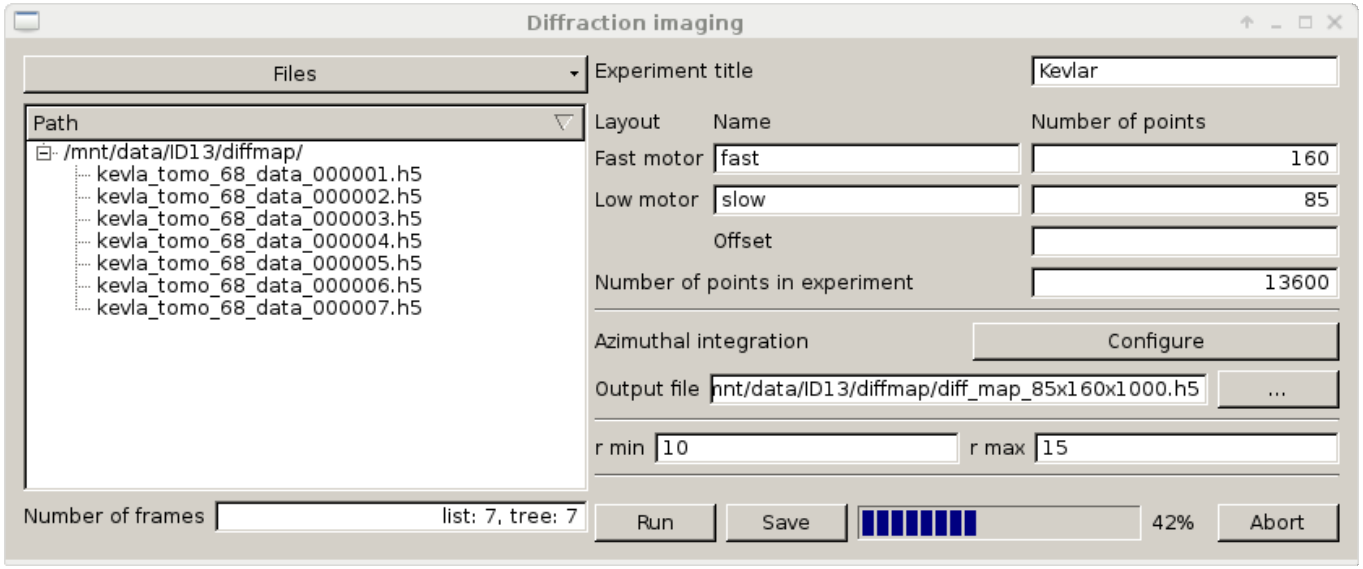
- **Module based detectors**
  - Mounting error on modules
  - From Dectris specifications:
    - **Error smaller than 1 pixel (172 µm)**
  - Fixed using HDF5 custom detector definition



Dectris Pilatus3 2M

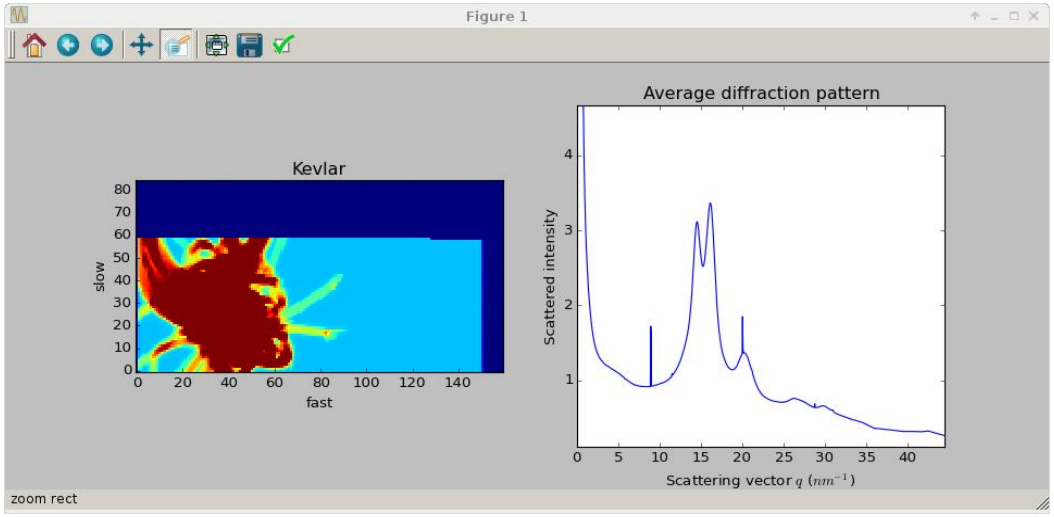
Pilatus 100K

Diffraction imaging offline tool: diff-map



Configuration screen

Processing result



Hand's on

DEMO

Diffmap

- **Time to eat**