Phase retrieval experiment

Phase retrieval experiment of Adrian Mancuso

Beam diffraction on slit is observed on three semi-transparent planes.
Three camera record these images.

Analysis of these images allows to retrieve the phase of the beam in the difraction plane,
as it is discussed in
Paganin Thesis.

On Adrian's request we provided a short `Python` code which allows to extract and manipulate with
three imaging arrays.

Code

This code example demonstrates how to access the HDF5 data from `Python.`
Code is located in `~dubrovin/LCLS/PyApps/PhaseRetrieval/ex_PhaseRetrieval.py`
and can be run from any of `psana0###` computers.
A few methods are provided to

- extract image-arrays from HDF5
- provide rotation and translation of original 640x480 images and put them in larger window for alignment
- average arrays over events
- save per-event or averaged arrays in files
- retrieve arrays from files
- plot images of three arrays and their differences
- zoom-in the area of interest on each image

Images

Some of features of this code are presented on these plots for data in file
`/reg/d/psdm/CXI/cxi80410/hdf5/cxi80410-r0734.h5`: