

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 diffraction 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`:

