



Education and Culture DG

ERASMUS MUNDUS

Contribution ID: 9

Type: **not specified**

Making Ptychography and CDI comparison

Wednesday, 17 May 2017 08:45 (30 minutes)

In the last decade, coherent X-ray diffraction imaging has become a high resolution lens-less imaging technique for materials characterization. In a number of fields, such as neutron/X-ray/electron diffraction, astronomy, X-ray crystallography and remote sensing, one can measure only the magnitude of the Fourier transform but not its phase which is lost at the detector. The phase problem is normally tackled by using iterative phase retrieval algorithms. This is achieved by projecting back and forth between a real space constraint (ie. Support) and a Fourier space constraint in which we replace the amplitude with measured data. Another technique is Ptychography which allows the sample to be larger than the beam. By scanning the beam relative to the sample, we can reconstruct both the probe function and the sample if there is sufficient overlap area (normally > 60%) between adjacent probes. During this presentation, I will illustrate some widely used iterative phasing algorithms (eg. Error reduction, Hybrid Input-Output, Difference map) with a Python code which is able to reconstruct a ESRF logo from its diffraction pattern. Then I will present the result of 3D reconstruction of the same gold nanocrystal using both CDI and Ptychography.

Primary author: Mr YANG, Ziye (ESRF)

Presenter: Mr YANG, Ziye (ESRF)

Session Classification: Student Session