Contribution ID: **245** Type: **poster**

Nano-tomography at the cSAXS beamline

Wednesday, 18 September 2013 12:15 (2 hours)

Imaging specimens in three-dimensions with a resolution of 100 nm or below is not an easy task, especially when representative volume elements of several tens of micrometers are required. In general, hard x-rays in the multi-keV range are needed in order to reach a depth of focus larger than the entire specimen. However, the fabrication of efficient x-ray lenses at these energies is a challenging task. In addition, the absorption contrast at these high energies is in most cases very weak, making phase contrast imaging methods essential. One of the proposed methods to overcome this issue is ptychography, which uses coherent diffraction patterns recorded in the far field in order to reconstruct the complex-valued transmissivity of the specimen. Thereby, it can provide both absorption and phase contrast images with high resolution, which is not limited by any magnifying lens [1]. At the cSAXS beamline we routinely use this technique in combination with tomography to obtain three-dimensional density maps of specimens which are several tens of micrometers in size. Here we present the ptychographic tomography technique in detail and our latest developments in image processing and tomography reconstruction. We further report on the status of the OMNY project [3], which will provide an instrument for imaging specimens at cryogenic temperatures with a resolution down to about 10 nm in three dimensions.

[1] H. M. L. Faulkner and J. M. Rodenburg, Phys. Rev. Lett 93 (2004) 023903.
[2] M. Dierolf et al., Nature 467 (2010) 436-439.
[3] M. Holler et al., Rev. Sci. Instrum. 83 (2012) 073703.

Primary author: Dr DIAZ, Ana (Paul Scherrer Institut)

Co-authors: MENZEL, Andreas (Paul Scherrer Institut); Dr DA SILVA, Julio Cesar (Paul Scherrer Institut - Swiss Light Source); Dr GUIZAR-SICAIROS, Manuel (Paul Scherrer Institut); Dr HOLLER, Mirko (Paul Scherrer Institut)

Presenter: Dr GUIZAR-SICAIROS, Manuel (Paul Scherrer Institut)

Session Classification: Poster session I and lunch