

Multi-Order Imaging with Multilayer Zone Plates

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Diffractive optics such as Multilayer Laue Lenses and Multilayer Zone Plates (MZPs) have emerged as nano-focusing optics in the hard x-ray regime around 8 keV and higher. In “traditional” set-ups, the negative and higher diffractive orders are blocked out by an Order Sorting Aperture (OSA); here we show that multi-order holographic datasets in a scanning set-up can be disentangled using a “software-OSA”. This allows for more flexibility in the experiment, a zoom-in capability at different field-of-views, and the correlation of different contrast mechanisms.

We show how to extract high-resolution differential phase contrast information on a nanometre scale combined with a micro-metre sized phase-reconstruction; see the figure for an example on nanowires.

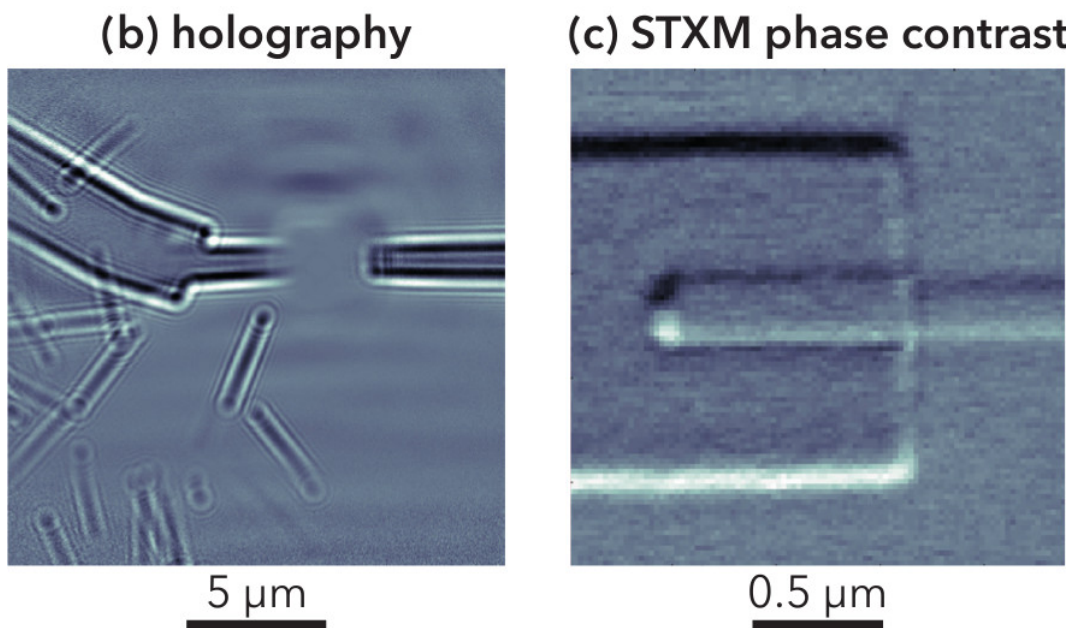


Figure 1: Holographic and differential phase information extracted from a single dataset using an MZP optic at 13.8 keV X-ray energy.