

Dark field, microscopic and tomographic implementations of edge-illumination phase contrast imaging

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Edge-illumination and coded-aperture are X-ray phase-contrast imaging techniques capable of quantitative retrieval of absorption, phase, and ultra-small-angle X-ray scattering. They require two partially absorbing masks, with relatively large pitches, matched with the detector such that a one-to-one relationship exists between apertures and pixels. We will focus the discussion on the so-called dark-field imaging which produces representations of the sample structure at sub-pixel scale lengths, providing complementary information with respect to absorption and phase. High resolution implementations of these methods can be realized by using a highly demagnified pre-sample mask. Finally, the extension of those imaging methods from planar to three-dimensional will be presented.