Effect of Partial Coherence on the Reconstruction of Coherent X-ray Diffraction Patterns.

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Current advances in experimental facilities provide high-brightness x-ray beams with a high degree of coherence. The coherence lengths achievable with these synchrotron radiation sources are in the range of few microns. Illuminating of a crystalline particle of nano-meter scale by this highly coherent beam has allowed recently the observation of continuous interference diffraction patterns. The diffraction from such nano-crystals is no longer comprised of sharp Bragg peaks, but of a complicated intensity distribution centered at each reciprocal lattice point. Applying iteration procedure of the Gerchberg-Saxton-Fienup type we inverted this to produce a real space image of the shape of the sample. We found out that inverted real space images from experimental data possess certain features (bright small spots on averaged background) that can not be explained by scattering of the totally coherent radiation. In this presentation we will discuss how partial coherence of the incoming x-ray beam can change the resulting image of the sample.