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Experimental Recovery of Sample And Coherence Information in Coherent Diffractive Imaging

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Coherent diffractive imaging (CDI) is a powerful method for recovering the transmission function of an object from its far-field diffraction pattern using iterative algorithms [1]. Recently, it has been shown that CDI works with partially coherent beam [2]. Methods have been developed for dealing with CDI data for which the coherence properties of the illumination are unkown [3]. In this work, we develop a method to simultaneously recover the object's phase and characterise the coherence properties of the illuminating wavefield without any a priori knowledge. The validity of our method is demonstrated using experimental diffraction data from the Soft X-ray Imaging beamline.

References
[1] J. R. Fienup, "Phase retrieval algorithms: a comparison," Appl. Opt. 21(15), 2758–2769 (1982).
[2] L. W. Whitehead, G. J. Williams, H. M. Quiney, D. J. Vine, R. A. Dilanian, S. Flewett, K. A. Nugent, A. G. Peele, E. Balaur, and I. McNulty, "Diffractive Imaging Using Partially Coherent X Rays", Phys. Rev. Lett. 103, 243902 (2009).
[3] Pierre Thibault, Andreas Menzel, " Reconstructing state mixtures from diffraction measurements", Nature, Vol 494, 68-71, 07 February 2013.

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Summary

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