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Developments in Partially Coherent Ptychography

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Ptychography has rapidly developed into a widespread technique for high-resolution X-ray microscopy due to improvements in image quality and the added flexibility over conventional Coherent Diffractive Imaging (CDI) techniques. These benefits are achieved via scanning the sample across a finite incident beam such that overlapping regions reinforce the solution for the sample transmission function in the diffraction data. Recent developments in position correction algorithms ameliorate the problems associated with sample stage drift and hysteresis during image acquisition and reduce drift artefacts. Nevertheless, its application to table-top sources has been less rapid due to their limited coherent flux. Such an extension is vital if diffraction microscopy is to become a widespread and routine imaging modality. In this talk, we present recent results of ptychographic diffractive imaging using partial spatial and temporal coherence and suggest a new condition for the optimal overlap parameter when imaging using partially coherent radiation. This has important implications for users wishing to apply ptychography to conventional sources that may not meet the stringent coherence requirements for conventional diffractive imaging.

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Summary

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