

# Ptychographic iterative diffraction microscopy with laser light

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The ptychographic iterative engine (PIE) technique [1] is a promising combination of the shifting illumination approach proposed by Hoppe [2] and standard iterative phase retrieval techniques [3,4]. It converges rapidly and eliminates the ambiguity between the 'true' solution and its complex conjugate. Meanwhile proof-of-principle studies have been published for visible laser light [5] and hard x-rays of about 1.5 Å wavelength [6]. Here we report on systematic studies of the error of the recovered amplitude and phase images as a function of the amount of overlap between individual probe positions. The simulations presented here are evaluated using a phase offset invariant error metric [7]. Experimental data are shown for a HeNe laser light PIE setup. The results of this study are of potential interest for PIE at all wavelengths.

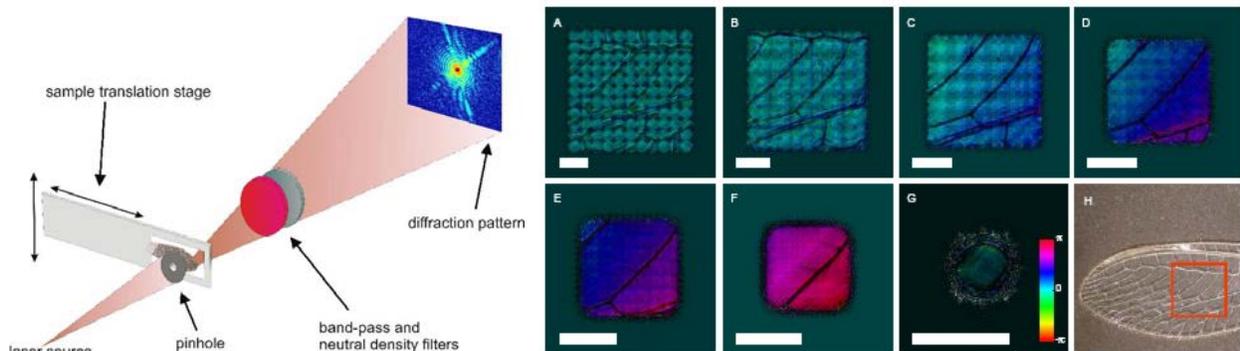


Figure 1, Left: The scanning diffraction microscopy setup. Right: Reconstructed phase profiles for different overlaps of the individual probe positions (A-G) and the sample under an optical microscope (H).

## References:

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