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A. Fannjiang*, One Shields Avenue, Davis, CA 95616-8633, and **P. Chen** and **Z. Zhang**.

Ptychography: uniqueness and reconstruction.

Ptychography with an unknown mask and object is analyzed for both the lattice scheme and the non-lattice mixing schemes under general mask phase constraint and object support constraints.

Furthermore, we show that in the case of the mixing schemes the only ambiguities are a constant scaling factor and an affine phase factor.

In the case of the lattice scheme, the mask and object errors have additional τ^2 degrees of uncertainty where τ is the stepsize of the raster scan, consistent with the raster grid pathology reported in literature.

We present a reconstruction scheme informed by the mask phase constraint whose numerical performance matches the predictions of the theory. (Received July 19, 2018)