Physics > Data Analysis, Statistics and Probability

# Three dimensional structure from intensity correlations

Veit Elser

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We develop the analysis of x-ray intensity correlations from dilute ensembles of identical particles in a number of ways. First, we show that the 3D particle structure can be determined if the particles can be aligned with respect to a single axis having a known angle with respect to the incident beam. Second, we clarify the phase problem in this setting and introduce a data reduction scheme that assesses the integrity of the data even before the particle reconstruction is attempted. Finally, we describe an algorithm that reconstructs intensity and particle density simultaneously, thereby making maximal use of the available constraints.

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