

An invitation to quantum tomography

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The quantum state of a light beam can be represented as an infinite dimensional density matrix or equivalently as a density on the plane called the Wigner function. Quantum tomography is an inverse statistical problem in which the state is the unknown parameter and the data is given by results of measurements performed on identical quantum systems.

The message of the talk is that theoretical statistics provides suitable tools for a quantitative study of quantum tomography, as a complement to the methods used in the physics literature. We will make a comparison with computerized tomography, and then focus on consistency of different estimators, rates of convergence, deconvolution of the noise coming from detection inefficiency.