Tomography of Correlation Functions in Sodium Bose-Einstein Condensates

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We present a novel experimental scheme for reconstructing single-particle correlation functions of ultracold atoms from absorption images taken after various time of flights. The efficiency of this scheme is experimentally demonstrated in two different systems, i.e., a sodium Bose-Einstein condensate with an imprinted phase controlled by a digital mirror device, and a quasi-one-dimensional Bose gas of ultracold sodium atoms. This scheme is independent of atomic species, and may thus be applicable to other ultracold atomic systems.

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