Abstract Submitted
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Interaction-induced loss of contrast in Michelson-type atom interferometers[1] MAXIM OLSHANII, USC, VANJA DUNJKO, USC — We develop an analytic model able to quantitatively explain the degradation of contrast in the recent experiment with the Michelson interferometer on a chip (Y.-J. Wang et al, cond-mat/0407689). We show that the main source of degradation is the interaction-induced distortion of the interferometric path, while the first-order coherence does not play any role. The nonlinear WKB technique we introduce allows one to deduce that interaction between two atoms in opposite interferometer arms is effectively a factor of two stronger than the one within the same arm, due to an unexpected Fock correction. Our results stand in an excellent agreement with the experimental data.

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Maxim Olshanii
USC

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