

Abstract Submitted
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The relative population distribution of atoms in the output ports of atom Michelson interferometers EBUBECHUKWU ILO-OKEKE, ALEX ZOZULYA, Worcester Polytechnic Institute — An atom Michelson interferometer uses off-resonant laser beams to split a cloud of Bose-Einstein condensate (BEC) into two clouds that travel along different paths and are recombined using identical splitting laser beams. Three clouds emerge after recombination. The population of atoms in each cloud gives an insight on the relative phase-shift accumulated by the atoms during their propagation. We derive an expression for the probability density of counting any number of atoms within the three different clouds, calculate the characteristic features of the probability density like the expectation value, the variance and the cross-correlation, discuss the dependence of the probability density and its characteristic features on the atomic interactions, and relate our results with experiment.

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