

Abstract Submitted
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Experimental realization of a guided matter wave interferometer with enclosed area CHANGHYUN RYU, MALCOLM BOSHIER, Physics Division, Los Alamos National Laboratory — An atom interferometer has been developed mainly for inertial sensing application. For this application, it is necessary for an atom interferometer setup to be small enough to be deployable. A compact guided matter wave interferometer has been studied as a smaller alternative to a free space atom interferometer. One important requirement for general inertial sensing is to have enclosed area for rotation sensing. Here we will present the current status of our effort to realize a guided matter wave interferometer with enclosed area. The linear guide for a BEC consists of a single laser beam. This beam is sent through an AOM for the movement of the guide. The transport of atoms can be achieved by changing the frequency of an AOM with optimized waveforms. With this setup a BEC was moved up to 1.5mm with 20ms transport time with minimum excitation. The interferometer measurement was done with three standing wave light pulses and coherence was observed up to 40ms interrogation time. By applying interferometer pulses while the waveguide is moving, enclosed area can be created for a guided matter wave interferometer. We will report the progress on this effort.

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