

Abstract Submitted
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Demonstration of Long coherence Times in Guided Atom Interferometers¹ SAIJUN WU, EDWARD SU, TAO HONG, MARA PRENTISS, Harvard University — For the first time, we demonstrate that guiding atoms increases the interrogation time in an interferometer by preventing the atom sample from expanding and falling under gravity as it would if the same atom sample were left in free space. The increase in interrogation time is approximately a factor of 2, with guided atom interrogation times exceeding 25 ms. Our atom interferometers are based on Talbot-Lau interferometry. We will discuss decay mechanisms for the interference fringe contrast and point out new directions in atom optics and precision measurement opened by our guiding techniques.

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Saijun Wu
Harvard University

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