

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Experimental Validation of Interferometry Simulations on an Atom Chip VIOLETA PRIETO, JASON ALEXANDER, CHRISTOPHER ROWLETT, WILLIAM GOLDING, PATRICIA LEE, Sensors and Electron Devices Directorate, US Army Research Laboratory, Adelphi, MD — We report on recent experimental results on manipulating cold atoms trapped on a chip for the development of a compact atom interferometer using a double-well potential. The experiment uses ^{87}Rb atoms magnetically confined in an atomic waveguide produced by wires on the surface of a lithographically patterned chip. The double-well potential is created by dynamically changing the current configuration on our atom chip. By dynamically powering traces on the atom chip while simultaneously varying external bias fields, we offer a means to coherently split the atomic cloud. We investigate real-time transformations, both adiabatic and non-adiabatic, between different double-well configurations and study their effects on the initially trapped atoms. We examine the coherence properties of the two atomic wavepackets and evaluate their potential use in an atom interferometer.

Violeta Prieto
Sensors and Electron Devices Directorate,
US Army Research Laboratory, Adelphi, MD

Date submitted: 25 Nov 2012

Electronic form version 1.4