

SES05-2005-000174

Abstract for an Invited Paper
for the SES05 Meeting of
the American Physical Society

Towards Atom Interferometry using Bose-Einstein Condensates

CHARLES SACKETT, University of Virginia

Just as the laser revolutionized optical interferometry, it can be hoped that Bose-Einstein condensation (BEC) will permit great advances in atom interferometry. Potential applications include inertial navigation, oil exploration, and measurements of chemical interactions. However, BEC interferometry also presents substantial challenges. Experiments to date have been limited to propagation times of about 10 ms, which is too short for precision measurements. It is thought that interatomic interactions are the main limiting factor. We will describe our recent implementation of a BEC apparatus including a novel waveguide structure that is capable of confining atoms at very low densities to avoid interaction effects. We will also report on our efforts to observe interference in this device.