SES15-2015-000150

Abstract for an Invited Paper
for the SES15 Meeting of
the American Physical Society

Microwave Forces and Potentials with Atom Chips[1]

SETH AUBIN, College of William & Mary

We report on the successful observation of the AC Zeeman force produced by a microwave near-field on an atom chip. We have verified both its spin-dependence and bipolar nature using ultracold ^{87}Rb atoms. In principle, AC Zeeman forces can confine any spin state at arbitrary magnetic fields and can simultaneously target qualitatively different potentials to individual states. Atom chips are ideal platforms for producing these traps since they can produce strong near-field potentials and gradients. Notably, the potential roughness associated with atom chip micro-magnetic traps is expected to be strongly suppressed in AC Zeeman chip traps. These microwave potentials are well suited for studies of one-dimensional quantum gases with tunable interactions and spin-dependent trapped atom interferometry.

In collaboration with Charles Fancher and Andrew Pyle, College of William & Mary.

[1]Work supported by AFOSR and W&M