Abstract Submitted
for the DAMOP05 Meeting of
The American Physical Society

Quantum reflection at normal incidence THOMAS PASQUINI, YONG-IL SHIN, MICHELE SABA, GYU-BOONG JO, DAVID PRITCHARD, WOLFGANG KETTERLE, Massachusetts Institute of Technology — Quantum reflection occurs when an atom reflects from an attractive potential without reaching a classical turning point. Atoms will exhibit quantum reflection from the Casimir-Polder potential of a solid surface at sufficiently low incident velocity. Trapped Bose-Einstein condensates of ^{23}Na, with peak density $10^{11} - 10^{12}$ atoms/cm^3, normally incident on a silicon surface exhibited reflectivity of up to 20% for incident velocities of $1 - 8$ mm/s. We discuss evidence for collective effects when a Bose-Einstein condensate undergoes quantum reflection, the possibility of confining atoms with solid surfaces, and recent experimental results.

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Date submitted: 08 Feb 2005 Electronic form version 1.4