Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Atom chip apparatus for experiments with ultracold rubidium and potassium[1] M.K. IVORY, A.R. ZILTZ, C.T. FANCHER, A.J. PYLE, Dept. of Physics, College of William and Mary, D. JERVIS, Dept. of Physics, University of Toronto, S. AUBIN, Dept. of Physics, College of William and Mary — We present a dual chamber apparatus for experiments with ultracold gases of ^{87}Rb and ^{39}K atoms on an atom chip. The apparatus produces quasi-pure Bose-Einstein condensates (BEC) of 3×10^4 ^{87}Rb atoms in an atom chip micro-magnetic trap. We operate a ^{39}K magneto-optical trap (MOT) and describe our progress toward loading these atoms into the chip trap. The apparatus features a dual-species MOT, a purely electrical magnetic transport system, and a radio-frequency (RF) capable atom chip system. The apparatus is well suited for studies of atom-surface forces, quantum pumping and transport experiments, and RF manipulation of cold atoms. We present our plans and progress for an experiment to study scattering of a BEC from an amplitude modulated barrier, a first step toward observing quantum pumping. We also detail our progress on using RF potentials for mechanical manipulation of ^{39}K atoms at the chip.

[1]This work was supported by Jeffress Memorial Trust, VSGC, and the College of William and Mary.

Seth Aubin
Dept. of Physics, College of William and Mary

Date submitted: 29 Jan 2013 Electronic form version 1.4