

Abstract Submitted
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Fabrication of an Atom Chip for Studying Atom-Surface Interactions. OWEN CHERRY, JEFF CARTER, Department of Physics, University of Waterloo, CZANG-HO LEE, Department of Electrical and Computer Engineering, University of Waterloo, REENA AL-DAHLEH, CIRFE Labs, University of Waterloo, JAMES D. D. MARTIN, Department of Physics, University of Waterloo — Using photolithography processes, we have fabricated a chip-based magnetic micro-trap (atom chip) suitable for trapping Rb atoms close to a gold surface in order to study atom-surface interactions. The surface, separated from the trapping wires by a polyimide dielectric, also acts as a shield to block out stray electric fields from the wires. The polyimide layer is highly planarizing to minimize surface corrugations, but $< 5 \mu\text{m}$ thick to attain the high magnetic field gradients required to bring the trapped atoms within $2 \mu\text{m}$ of the surface. A lift-off process has been developed to fabricate evaporated gold wires with edge roughness $\sim 100 \text{ nm}$, limited by the grain size of the gold. Results of atom chip performance and trap loading are presented.

James D. Martin
Department of Physics, University of Waterloo

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