Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Improved ion addressing in surface electrode traps using compensating sequences J. TRUE MERRILL, Georgia Institute of Technology, S. CHARLES DORET, Georgia Tech Research Institute, KENNETH BROWN, Georgia Institute of Technology, ALEXA HARTER, Georgia Tech Research Institute — Several proposed quantum processor architectures require precise control over the intensity, duration, and spatial alignment of laser pulses. In particular, single-ion laser addressing in quantum registers composed of tightly-spaced ion chains is sensitive to errors introduced by pointing instabilities and by the finite beam waist. Compensating pulse sequences may relax these precision requirements by producing accurate gates in the presence of unknown systematic errors. Here we report on experimental progress in the suppression of systematic errors in the control of $^{40}Ca^{+}$ ions in a microfabricated surface electrode trap. Further, we discuss other systems where compensating sequences may be used to produce accurate gates in the presence of control errors.

True Merrill
Georgia Institute of Technology

Date submitted: 27 Jan 2012 Electronic form version 1.4