Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Towards Studying Transport Phenomena with Trapped Ions MICHAEL RAMM, THANED PRUTTIVARASIN, BOYAN TABAKOV, University of California, Berkeley, AXEL KREUTER, Lawrence Berkeley National Laboratory, NIKOS DANIILIDIS, HARTMUT HÄFFNER, University of California, Berkeley — Transport of charge and energy are key phenomena for many technological applications. The basic transport mechanisms, particularly in the quantum regime, offer rich physics. For instance, the conditions necessary for a fully quantum system to equilibrate are still under debate. We started an experimental effort to study energy transport in the quantum regime by placing single ions in microtraps formed by a standing wave inside an optical resonator. The resulting anharmonic quantum oscillators are weakly coupled to each other via the Coulomb interaction. Such oscillator chains often serve as model systems for studying quantum transport phenomena and thermalization. We will discuss our experimental goals of following the propagation of a single excitation within the ion chain. Furthermore, we will describe the experimental setup including the cavity for the optical standing wave, vacuum apparatus, and microfabrication of a planar ion trap using a lift-off technique.

Michael Ramm
University of California, Berkeley

Date submitted: 27 Jan 2010 Electronic form version 1.4