Abstract Submitted
for the DAMOP05 Meeting of
The American Physical Society

Variable electrode micron-scale ion trap LOUIS DESLAURIERS, JIE LI, KATHY-ANNE BRICKMAN, PAUL HALJAN, WINNI HENSINGER, PATRICIA LEE, MARTIN MADSEN, JIM RABCHUK, DAN STICK, CHRISTOPHER MONROE, FOCUS Center and Department of Physics, University of Michigan — We describe a novel ion trap geometry formed with two needle-like electrodes mounted on linear translation stages, allowing for the trap electrode spacing to be varied in-situ over a range of separations between 20-1000μm. The variable electrodes may allow for the systematic study of a host of ion trap properties at the micron scale, such as electrode surface noise and ion heating. The results of this study may impact the design and construction of future ion trapping apparatus relevant to quantum information applications, and the open geometry of the trap may be suitable for interfacing cold trapped ions with other quantum systems. This work is supported by the U.S. National Security Agency and the Advanced Research and Development Activity under Army Research Office contract, and the National Science Foundation ITR Program.

Louis Deslauriers

Date submitted: 28 Jan 2005 Electronic form version 1.4