

Abstract Submitted  
for the DAMOP12 Meeting of  
The American Physical Society

**Advanced ion trap structures with integrated tools for qubit manipulation** J.D. STERK, F. BENITO, C.R. CLARK, R. HALTLI, C. HIGH-STRETE, C.D. NORDQUIST, S. SCOTT, J.E. STEVENS, B.P. TABAKOV, C.P. TIGGES, D.L. MOEHRING, D. STICK, M.G. BLAIN, Sandia National Laboratories, Albuquerque NM 87123 — We survey the ion trap fabrication technologies available at Sandia National Laboratories. These include four metal layers, precision backside etching, and low profile wirebonds. We demonstrate loading of ions in a variety of ion traps that utilize these technologies. Additionally, we present progress towards integration of on-board filtering with trench capacitors, photon collection via an optical cavity, and integrated microwave electrodes for localized hyperfine qubit control and magnetic field gradient quantum gates.

This work was supported by Sandia's Laboratory Directed Research and Development (LDRD) Program and the Intelligence Advanced Research Projects Activity (IARPA). Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the US Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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Date submitted: 30 Jan 2012

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