SAND2016-6750C

Abstract submission.
European Conference on Trapped Ions (ECTI),
Arosa, Switzerland, 29.08 - 2.09.2016.

Demonstration of the HOA Trap, a Versatile Microfabricated Surface Ion Trap

D. Lobser[1], M. G. Blain[1], K. Fortier[1], R. Haltli[1], A. Hollowell[1], J. Mizrahi, J. D. Sterk[1], P. Maunz[1]

[1]Sandia National Laboratories, Albuquerque, NM 87185, United States.

We characterize Sandia's High Optical Access (HOA) surface trap, which boasts very good performance including high trap frequencies, long trapping times, and low heating rates. The scalable HOA trap is outfitted with two junctions as well as segmented inner control electrodes with high voltage efficiency for shuttling and versatile manipulation of the potential. Through precise characterization of single- and two-qubit gates via Gate Set Tomography (GST) [1], we demonstrate high-fidelity QIP protocols that compete with standard electrode traps including single-qubit gates below the fault-tolerance threshold [2].

[1] R. Blume-Kohout *et al.*, arXiv:1310.4492 (2013).

[2] P. Aliferis *et al.*, Phys. Rev. Lett. 98, 220502 (2007).

Daniel Lobser
dlobser@sandia.gov

☐ This is an invited talk.
☒ This is a poster or hot topics talk.