

Abstract Submitted  
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**Trapping Ions in a 2-pi Parabolic Mirror** CHEN-KUAN CHOU, U of Washington, GANG SHU, Georgia Institute of Technology, BORIS BLINOV, U of Washington, U OF WASHINGTON TEAM — Trapped ion qubit is an excellent candidate for quantum computation and information due to its low decoherence, ease of control and detection, and ability to couple to a photon. Efficient coupling between ions and resonant photons is crucial for ion-photon and remote-ion entanglement protocols. We describe an operation of a RF ion trap in which a reflective parabolic surface serves as the trap's electrodes. This parabolic mirror covers a solid angle of approximately  $2\pi$  around the trapped ion, while a movable needle electrode allows precise ion placement at the focal point of the parabola. We measured approximately 40% solid angle fluorescence collection from a single Ba<sup>+</sup> ion with this setup, with an image spot size of about twice the diffraction limit. Progress on image correction and fiber coupling will be reported.

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