Abstract Submitted
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Investigating the laser angle dependence of movable pinhole traps for neutral atom quantum computing[1] TRAVIS FRAZER, DAVID ROBERTS, JASON SCHRAY, GLEN GILLEN, KATHARINA GILLEN-CHRISTANDL, California Polytechnic State University, San Luis Obispo — Neutral atom approaches meet all DiVincenzo quantum computing criteria but scalability. Our proposed solution is a two-dimensional array of dipole traps formed in the diffraction pattern immediately behind an array of pinholes [1]. For two-qubit gates, trapped atoms can be brought together and apart by changing the trap laser angle and exploiting the polarization dependence of the trapping potential [2]. We are investigating the diffraction pattern for a large range of angles of incidence through direct measurement and computations. We will present these results and our experimental progress with our in-house system for transferring atoms from our MOT to the pinhole traps.

[1] G. D. Gillen, et al., Phys. Rev. A 73, 013409 (2006).
[2] K. Gillen-Christandl and B. D. Copsey, Phys. Rev. A 83, 023408 (2011)

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