

Abstract Submitted
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2D Surface Trap for Quantum Simulation¹ JONATHON GILLEN,
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vard/MIT Center for Ultracold Atoms and Department of Physics Harvard Univer-
sity — We present a novel optical trapping scheme for low dimensional quantum
gases. Using a combination of evanescent waves, standing waves, and magnetic po-
tentials we create a 2D Bose-Einstein condensate at a distance of only a few microns
away from a glass surface. The trapping potentials near the surface are smooth
and allow for a highly anisotropic confinement with an aspect ratio of 300:1:1 as
well as long lifetimes of the 2D quantum gas. We are able to directly detect phase
fluctuations and vortices. The setup is especially suitable for many body quantum
simulations and applications such as high precision measurements close to surfaces.

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