Abstract Submitted
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Effect of synthetic magnetic fields on quasi-2D gases of bosons MATTHEW BEELER, KARINA JIMENEZ-GARCIA, LINDSAY LEBLANC, ABIGAIL PERRY, ROSS WILLIAMS, IAN SPIELMAN, Joint Quantum Institute, NIST and University of Maryland — An ultra-cold gas of atoms can realize many different model Hamiltonians. When tightly confined in one spatial dimension, the gas can become effectively 2D. At a critical temperature, a quasi-2D Bose gas undergoes a Berezinskii-Kosterlitz-Thouless (BKT) phase transition to a superfluid as thermally excited pairs of vortices with opposite circulation bind together [1]. In general, a superfluid responds to the presence of a synthetic magnetic field with the formation of vortices [2], expected to all have the same circulation direction. These vortices induced by the synthetic magnetic field should have an effect on the microscopic mechanism behind the BKT phase transition, which may alter the properties of the quasi-2D Bose gas.

[1] Hadzibabic, Z. *et al.*, Nature **441**, 1118–1121 (2006)
[2] Lin, Y.-J. *et al.*, Nature **462**, 628-632 (2009).

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