Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Helium-4 superfluid density; action-at-a-distance effects[1]
STEPHEN R.D. THOMSON, FRANCIS M. GASPARINI, The State University of New York University at Buffalo — We report results from experiments with ^{4}He confined in two concentric 277 nm thick planar regions that are connected across a ring which forms a thin film weak link 33 nm thick. Measurements of the superfluid fraction within rings of varying widths have shown that the planar regions affect the film in the ring over distances much longer than the correlation length ξ. These results are analogous to those reported for a different geometry of both the specific heat and superfluid fraction [1]. To investigate the width dependence of this proximity effect we have performed measurements with rings that are 8, 17, 40 and 100 μm wide. We will discuss our method of measurement and a possible mechanism for the long range action-at-a-distance effect suggested in [2] for the 2D Ising system.

[1] Perron J K et. al. 2013 *Phys. Rev. B* **87** 094507
[2] Abraham D B et. al. 2014 *Phys. Rev. Lett.* **113** 077204

[1]This work was supported by the NSF grant DMR-1101189 and utilized The Cornell Nanoscale Science and Technology Facility, Project No. 526-94.

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Date submitted: 11 Nov 2014 Electronic form version 1.4