

Abstract Submitted
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Weak to strong limits in confined superfluid helium¹ STEPHEN R.D. THOMSON, JUSTIN K. PERRON, FRANCIS M. GASPARINI, The State University of New York University at Buffalo — Experiments with ^4He confined in $(2\ \mu\text{m})^3$ boxes connected via a thin film 33 nm thick have shown that the boxes act as isolated entities when spaced 4 μm edge-to-edge [1], whereas when spaced 2 μm edge-to-edge, they are strongly coupled to each other [2]. To investigate the spatial dependence of this coupling we are currently measuring $(2\ \mu\text{m})^3$ boxes spaced 1 μm edge-to-edge. We report measurements of the specific heat and superfluid density of helium confined in this geometry. These new data will help us to map the transition between fully isolated to fully coupled boxes which, in this limit, should behave like a 2 μm thick film. Questions involving our understanding of the correlation length ξ arise, since it is observed that coupling is manifest over much larger distances than ξ .

[1] Perron J K, Kimball M O, Mooney K P and Gasparini F M 2010 *Nat. Phys.* **6** 499–502

[2] Perron J K, and Gasparini F M 2011 *submitted to PNAS*

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