

Abstract Submitted  
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**Critical point coupling in liquid helium and the significance of the correlation length<sup>1</sup>** JUSTIN K. PERRON, STEPHEN R.D. THOMSON, FRANCIS M. GASPARINI, The State University of New York, University at Buffalo

— Recent measurements of liquid helium confined to  $(2 \mu\text{m})^3$  boxes connected through a 33 nm film have shown coupling effects between boxes spaced distances much larger than the correlation length  $\xi(t, L)$ [1,2] and proximity effects on the connecting film[3]. An analysis of data suggests that  $\xi(t, L)$  is the relevant parameter in these effects. This dependence on  $\xi(t, L)$  is used to argue that the enhancement in the specific heat due to coupling is a reflection of the finite-size correlation length in the boxes and hence its scaling function. All this raises some profound questions about our physical understanding of  $\xi(t, L)$ .

[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*

[3] Perron J K, and Gasparini F M 2011 to be published in *JPCS*

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Justin K. Perron  
The State University of New York, University at Buffalo

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