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Random Field Driven Spatial Complexity at the Mott Transition in VO_2 ERICA CARLSON, SHUO LIU, BENJAMIN PHILLABAUM, Purdue University, West Lafayette, IN, USA, KARIN DAHMEN, University of Illinois at Urbana-Champaign, Urbana, IL, USA, NARSIMHAMURTHY VIDHYADHIRAJA, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, INDIA , MUMTAZ QAZILBASH, College of William and Mary, Williamsburg, VA, USA , DIMITRI BASOV, University of California San Diego, La Jolla, CA, USA
— We report the first application of critical cluster techniques to the Mott metal-insulator transition in vanadium dioxide. We show that the geometric properties of the metallic and insulating puddles observed by scanning near-field infrared microscopy are consistent with the system passing near criticality of the random field Ising model as temperature is varied. The resulting large barriers to equilibrium may be the source of the unusually robust hysteresis phenomena associated with the metal-insulator transition in this system.

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