

Abstract Submitted
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Double criticality in the magnetic field driven transition of a high-TC superconductor¹ BRIGITTE LERIDON, LPEM/CNRS -ESPCIParisTech - UPMC, 10 rue Vauquelin - 75005 Paris - France, JOHAN VANACKEN, V.V. MOSHCHALCOV, INPAC-KULeuven, Celestijnenlaan 200 D, B-3001 Heverlee, Belgium, BAPTISTE VIGNOLLE, CNRS/LNCMI, 143 Avenue de Rangueil, 31400 Toulouse, France, RAJNI PORWAL, R.C. BUDHANI, NPL, CSIR, New Delhi 110012, and IIT Kanpur, Kanpur 208016, India — The magnetic-field driven transition of a set of high critical temperature $La_{2-x}Sr_xCuO_4$ superconducting thin films has been investigated using high pulsed magnetic fields. For the underdoped samples, the existence of two distinct critical regions in the superconductor/insulator transition has been evidenced for the first time. The first quantum critical region is observed at intermediate magnetic fields ($\simeq 19T$) and temperatures and gives way at lower temperature to a quantum critical point at about twice critical magnetic field and resistance per square. The critical exponents inferred from scaling behaviour are markedly different for the two regions. We attribute this behaviour to the existence of a clean/dirty crossover due to the presence of electronic inhomogeneities.²

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²Brigitte Leridon, J. Vanacken, V.V. Moshchalkov, Baptiste Vignolle, Rajni Porwal, R.C. Budhani, Cond. Mat. arXiv:1306.4583

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