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Abstract for an Invited Paper for the NWS09 Meeting of the American Physical Society

Inhomogeneous Fluctuating Superconductivity Near Room Temperature¹ JEFF SONIER, Simon Fraser University

Over the past decade, a diverse set of experiments on high-transition temperature (T_c) cuprate superconductors have produced evidence for the existence of superconducting correlations on short time and/or length scales at temperatures well above the bulk T_c . This includes the discovery of an unusual magnetic-field induced effect in YBa₂Cu₃O_y and La_{2-x}Sr_xCuO₄ above T_c using an intense beam of spin-polarized muons at TRIUMF. The measurements show that an externally applied field induces a static internal magnetic field distribution at high temperatures far above T_c , and that the degree of field inhomogeneity is correlated with the bulk superconductivity that occurs below T_c . These findings indicate that non-uniform fluctuating superconductivity does survive in some samples at temperatures approaching room temperature. These experiments and the implications for room-temperature superconductivity will be discussed.

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