Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Inhomogeneous superconducting state and the intrinsic Tc: Near room temperature superconductivity in the cuprates VLADIMIR KRESIN, Lawrence Berkeley National Laboratory, STUART WOLF, University of Virginia — Doped cuprates are inhomogeneous superconductors and exhibit properties strongly affected by this inhomogeneity. The notion of an intrinsic critical temperature whose value greatly exceeds the resistive Tc is supported by a number of experimental studies and these will be reviewed in this talk. In particular the anomalous diamagnetism observed above the resistive transition is a manifestation of the presence of superconducting clusters embedded in a normal metallic matrix. The value of intrinsic critical temperature, that reflects the onset of superconductivity in the highest transition temperature clusters, is in some cuprates near room temperature. The transition to the fully superconducting state is percolative in nature and is strongly dependent on the inhomogeneities. Some consequences of such a system, including the ac response will be described.

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Date submitted: 08 Nov 2011 Electronic form version 1.4