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Ordering of dopants and potential increase of Tc to near room temperature STUART WOLF, University of Virginia, VLADIMIR KRESIN, Lawrence Berkeley Laboratory — This talk will describe a novel method to increase the resistive Tc of cuprate superconductors to values that might approach room temperature, especially if applied to the underdoped region of the Tc versus carrier concentration phase diagram. This is the part of the so-called pseudogap region that exhibits energy gaps and a small Meissner effect well above the maximum resistive transition [1]. The method proposed here involves ordering of the dopants that provide the itinerant holes in the copper oxygen planes. These dopants also act as pair breakers since they are defects in the structure. The strategy we are proposing here is to separate the regions with dopants which provide the itinerant carriers in the cuprate planes from the metallic but dopant free regions nearby, but far enough away to be not seriously affected by the proximity effect. If this separation can be carried out appropriately and we will describe how this will be done in the talk, there will be fully connected high Tc regions that can fully span a sample and present a very high temperature resistive transition, approaching room temperature for some of the cuprates.

[1] V.Z. Kresin and S.A. Wolf, ArXiv 1109.0341

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