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The effect of inhomogeneous pairing amplitude on superfluid stiffness in a d-wave superconductor MING CHENG, WU-PEI SU, Texas Center for Superconductivity and Department of Physics, University of Houston, Houston, TX 77204 — To explain the disparity between T_c and T^* in optimally doped and underdoped cuprates, we propose that T_c is related to superconducting gap amplitude standard deviation (σ); while T^* is related to average gap amplitude. We calculate the superfluid stiffness (D_s) using BdG formalism for a d- wave superconductor. The calculations show that D_s decreases as (σ) increases, suggesting lower T_c for more inhomogeneous gap distribution. The theoretic result is consistent with recent STM experiments which study the electronic inhomogeneities due to out-of-plane disorder.

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