

Abstract Submitted
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LDOS and Angle-Resolved Photoemission Spectral Function of An inhomogeneous Superconductor MING CHENG, W.P. SU, Texas Center for Superconductivity, University of Houston — Nanoscale inhomogeneity seems to be a central feature of the d-wave superconductivity in the cuprates. Such a feature can strongly affect the local density of states (LDOS) and the spectral weight functions. Within the Bogoliubov-de Gennes formalism we examine various inhomogeneous configurations of the superconducting order parameter to see which ones better agree with the experimental data. Nanoscale large amplitude oscillations in the order parameter seem to fit the LDOS data for the underdoped cuprates. The one-particle spectral function for a general inhomogeneous configuration exhibits a coherent peak in the nodal direction. In contrast, the spectral function in the antinodal region is easily rendered incoherent by the inhomogeneity. This throws new light on the dichotomy between the nodal and antinodal quasiparticles in the underdoped cuprates.

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