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**Mottness-induced healing in strongly correlated superconductors**

S. TANG, V. DOBROSAVLJEVIĆ, Florida State University, E. MIRANDA, State University of Campinas, Brazil — We study impurity healing effects in models of strongly correlated superconductors. We show that in general both the range and the amplitude of the spatial variations caused by nonmagnetic impurities are significantly suppressed in the superconducting as well as in the normal states. We explicitly quantify the weights of the local and the non-local responses to inhomogeneities and show that the former are overwhelmingly dominant over the latter. We find that the local response is characterized by a well-defined healing length scale, which is restricted to only a few lattice spacings over a significant range of dopings in the vicinity of the Mott insulating state. We demonstrate that this healing effect is ultimately due to the suppression of charge fluctuations induced by Mottness. We also define and solve analytically a simplified yet accurate model of healing, within which we obtain simple expressions for quantities of direct experimental relevance, such as the healing length.

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