Title:	Suppression of s-wave superconductivity by kinetic disorder in a two-dimensional attractive Hubbard model
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Abstract:	We investigate the influence of diagonal and off-diagonal disorder potentials on superconductivity in an attractive Hubbard model. The study is motivated by recent experimental and theoretical interest in understanding the microscopic mechanism by which impurities destroy superconductivity. In order to capture the spatial correlations accurately, we make use of the real-space Bogoliubov-de Gennes mean field method. We find that the response of a superconductor to disorder crucially depends, even qualitatively, on the type of disorder considered. Superconductivity is suppressed spatially homogeneously by off-diagonal (kinetic) disorder in comparison to the suppression by diagonal (potential) disorder which proceeds via the formation of strongly superconducting islands. Moreover, the non-superconducting phase is gapless in the case of kinetic disorder, suggesting a fermionic superconductor-insulator transition (SIT). This is in sharp contrast to the SIT tuned by diagonal disorder, which is understood to be bosonic in nature. A qualitatively distinct mechanism that allows for a BCS-like suppression of superconductivity with increasing disorder is, in fact, consistent with recent experiments on amorphous Bi films
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