

Abstract Submitted
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Can short-ranged orders enhance superconductivity of cuprates?¹

KYUNGMIN LEE, EUN-AH KIM, Cornell University — Recent advances in experiments established short-ranged orders associated with tendencies for spatial symmetry breaking as universal phenomena of underdoped cuprates. This brings the question of the relationship between these short-ranged orders and superconductivity to the forefront of the study of high T_c superconductivity. Here we study this issue paying special attention to the role form-factors play. Using both non-self-consistent and self-consistent Bogoliubov-de Gennes equation with real-space realization of short-range order we investigate how the short-ranged order affect the electronic structure as well as superconducting tendencies. Typically an inhomogeneous potential due to short-ranged ordering patterns will act as a scatterer that is detrimental to unconventional superconductor which is not protected through Anderson's theorem. However we find that that form factor of the short-ranged ordering form can make consequential differences in the way short-range order interact with superconductivity, with the possibility of enhancing superconductivity.

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