

Abstract Submitted
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Using Inhomogeneity to Raise Superconducting Critical Temperatures YEN LEE LOH, ERICA W. CARLSON, Purdue University — There has been a surge of interest in the physics of inhomogeneous superconductors due to recent experiments that have detected strong local inhomogeneity in the high-temperature cuprate superconductors. An important question is whether local inhomogeneity helps or harms superconductivity, or if it is irrelevant. We present a study of inhomogeneous 2D XY models, which describe superconducting films with low superfluid density. Using Monte Carlo simulation and finite-size scaling, we show that *certain* types of inhomogeneity (“frameworks”) can significantly increase the transition temperature while preserving the zero-temperature long-wavelength properties. We support our conclusions with corresponding analytic results for Ising models.

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