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Stability of inhomogeneous superconducting states in the doped t-J model MANUELA CAPELLO, DIDIER POILBLANC, Laboratoire de Physique Theorique, CNRS, and Universite Paul Sabatier, Toulouse, France — By using Variational quantum Monte Carlo techniques, we have investigated the stability of inhomogeneous RVB superconducting states in the t-J model at doping $1/8$. We show that introducing half-filled charge domain walls involves very small energy costs, especially in the presence of tetragonal-lattice distortions [1]. This suggests that spontaneous unidirectional modulations of the hole density and the superconducting order parameter could easily be stabilized in real materials, in the presence of small perturbations. We argue that such a scenario is at play in the recently observed patterns of unidirectional domains in high- T_c superconductors [1].

[1] M. Capello et al. (in preparation).

[2] Y. Kohsaka et al. Science 315, 1380 (2007).

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