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Robust nodal d-wave spectrum in simulations of strongly fluctuating competing order in underdoped cuprates[1] WILLIAM ATKINSON, Trent University, J. DAVID BAZAK, McMaster University, BRIAN ANDERSEN, Neils Bohr Institute — While many experiments suggest that the pseudogap in cuprate superconductors originates from some nonsuperconducting broken-symmetry phase, clear spectral signatures of such a phase have not been observed in angle resolved photoemission experiments. We report on numerical simulations of the spectral function, in which competing superconducting and nonsuperconducting phases experience strong thermal fluctuations. In our work, we consider the competition between d-wave superconductivity and a low temperature spin density wave (SDW) phase that is widely observed in underdoped cuprates. Because of this competition, our simulations sample highly inhomogeneous states that are far from the mean-field saddle point configurations. We find that the computed spectral function is, in many cases, almost indistinguishable from that of the pure d-wave superconductor, and that there is no sign of the Fermi surface reconstruction generically expected for SDW phases. We argue that this work explains the absence of any clear experimental signature of such a reconstruction. We find that signatures of the fluctuating competing order can be found mainly in a splitting of the antinodal band and, for strong magnetic order, in small induced nodal gaps similar to those found in recent experiments

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