Abstract Submitted
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Knight shifts, nuclear spin-relaxation rates, and spin echo decay times in the pseudogap regime of the cuprates: Simulation and relation to experiment[1] XI CHEN, Univ of Michigan - Ann Arbor, JAMES LEBLANC, Memorial University of Newfoundland, EMANUEL GULL, Univ of Michigan - Ann Arbor — We study the temperature and doping evolution of the NMR Knight shift, spin relaxation rate, and spin echo decay time in the pseudogap regime of the two-dimensional Hubbard model for parameters believed to be relevant to cuprate superconductors using cluster dynamical mean field theory. We recover the suppression of the Knight shift seen in experiment upon entering the pseudogap regime and find agreement between single and two-particle measures of the pseudogap onset temperature T^*. The simulated spin-echo decay time shows a linear in T behavior at high T which flattens off as T is lowered, and increases as doping is increased. The relaxation rate shows a marked increase as T is lowered but no indication of a pseudogap on the Cu site, and a clear downturn on the O site, consistent with experimental results on single layer materials but different from double layer materials. The consistency of the simulated susceptibilities with experiment, along with similar agreement on the single-particle level and the absence of long-range order and symmetry breaking suggests that the pseudogap is well described by strong short-range correlation effects and that long-range order and multi-orbital effects are not required.

[1]Simons Foundation

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