Abstract Submitted
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Evolution of the Superconductivity Dome in the two dimensional Hubbard Model[1] KUANG-SHING CHEN, University of Wuerzburg, ZIYANG MENG, University of Toronto, SHUXIANG YANG, Louisiana State University, THOMAS PRUSCHKE, University of Göttingen, JUANA MORENO, MARK JARRELL, Louisiana State University — By means of large-scale dynamical cluster quantum Monte Carlo simulations, we are able to identify the evolution of the d-wave superconducting dome in the hole-dope side of the phase diagram, with next-nearest-neighbor hopping (t'), chemical potential and temperature as control parameters. To obtain the superconducting transition temperature T_c, we employ two-particle measurements of the pairing susceptibilities. As t' goes from positive to negative values, we find the d-wave projected irreducible pairing vertex function is enhanced, and the curvature of its doping dependence changes from convex to concave, which fixes the position of the maximum superconducting temperature at the same filling ($n \approx 0.85$) and constraints the dome from precisely following the Lifshitz line. We furthermore decompose the irreducible vertex function into fully irreducible, charge and spin components via the parquet equations, and consistently find that the spin component dominates the pairing vertex function in the doping range where the dome is located.

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