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Superconducting Fluctuations in the Normal State of the Two-Dimensional Hubbard Model XI CHEN, JAMES LEBLANC, EMANUEL GULL, University of Michigan — The dynamical mean field theory and its cluster extensions, such as the dynamical cluster approximation, are effective and accurate methods for solving the 2D Hubbard model. Progress is limited by exponential scaling, especially for quantities relevant to superconducting correlations. In this work, we demonstrate how the vertex contribution to the pairing susceptibility can be used as an indicator of the proximity to the superconducting transition temperature. This allows us to analyze a wider region of parameter space at a higher (numerically accessible) temperature in the normal state. The optimal interaction strength, doping and next-nearest hopping for $d_{x_2-y_2}$ superconductivity are located. We conclude that optimal transition temperature occurs at intermediate coupling strength, electron-doped side. This approach is systematically extended to other superconducting symmetries as well. A change in sign of the vertex contribution to d_{xy} superconductivity from repulsive near half filling to attractive at large doping is discovered.

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