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Finite-temperature superconducting correlations in the square lattice Hubbard model EHSAN KHATAMI, RICHARD SCALETTAR, RAJIV R.P. SINGH, University of California, Davis — We utilize numerical linked-cluster expansions (NLCE) [1,2] to study superconducting properties of the repulsive Fermi-Hubbard model on the square lattice. Within NLCE, temperature-dependent properties in the thermodynamic limit can be obtained from exact diagonalization of small clusters. We calculate the pairing correlation functions, structure factor, and correlation length for d-wave and extended s-wave symmetries at, and especially away from, half filling for a wide range of interaction strengths. A relatively strong tendency to d-wave pairing away from half filling is revealed after subtracting the uncorrelated contributions. We compare our findings to improved results from the determinantal quantum Monte Carlo simulations on large finite clusters with periodic boundary condition.

[1] M. Rigol, T. Bryant, and R. R. P. Singh, Phys. Rev. Lett. 97, 187202 (2006).
[2] E. Khatami and M. Rigol, Phys. Rev. A 84, 053611 (2011).

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