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The Structure of the Pairing Interaction in the 2D Hubbard Model THOMAS MAIER, Oak Ridge National Laboratory, MARK JARRELL, University of Cincinnati, DOUGLAS SCALAPINO, University of California — We present a detailed analysis of the effective pairing interaction in the doped two-dimensional Hubbard model. Using dynamical cluster Monte Carlo calculations we have studied the irreducible particle-particle vertex responsible for pairing in this model. The leading low temperature eigenvalue of the Bethe-Salpeter equation for the particle-particle channel is shown to have $d_{x^2-y^2}$-wave symmetry. The irreducible particle-particle vertex increases with increasing momentum transfer and decreases when the energy transfer exceeds a scale associated with the $Q = (\pi, \pi)$ spin susceptibility. Using an exact decomposition of this vertex into a fully irreducible two-fermion vertex and charge and magnetic exchange channels, the dominant contribution to the effective pairing interaction is found to come from the magnetic, spin $S = 1$ exchange channel.

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