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Effects of longer-range interactions on unconventional superconductivity[1] SRINIVAS RAGHU, Stanford University, EREZ BERG, Harvard University, ANDREY CHUBUKOV, University of Wisconsin, Madison, STEVEN KIVELSON, Stanford University — We analyze the effect of the non-vanishing range of electron-electron repulsion on the mechanism of unconventional superconductivity. We present asymptotically exact weak-coupling results for dilute electrons in the continuum and for the 2D extended Hubbard model, as well as density-matrix renormalization group results for the two-leg extended Hubbard model at intermediate couplings, and approximate results for the case of realistically screened Coulomb interactions. We show that T_c is generally suppressed in some pairing channels as longer range interactions increase in strength, but superconductivity is not destroyed. Our results confirm that electron-electron interaction can lead to unconventional superconductivity under physically realistic circumstances.

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