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Disordered superconductors: role of interaction strength¹ RAIMUNDO DOS SANTOS, FELIPE MONDAINI, THEREZA PAIVA, Universidade Federal do Rio de Janeiro, RICHARD SCALETTAR, UC-Davis — We have considered the half-filled disordered attractive Hubbard model, in which the on-site attraction is switched off on a fraction f of sites, while keeping a finite U on the remaining ones. The configurationally-averaged equal-time pair structure factor has been calculated as a function of temperature, through Quantum Monte Carlo simulations for several f and U, and a finite-size scaling *ansatz* has been used for the zero-temperature gap. We have found that the system sustains superconductivity in the ground state up to a critical impurity concentration, f_c , which increases with U, at least up to the largest values of U we have considered. Also, the normalized zerotemperature gap as a function of f, for fixed U, shows a maximum near f_m , within a range of U values, thus indicating that a small amount of disorder can initially enhance superconductivity. We argue that, overall, the observed behavior results from both the breakdown of CDW-superconductivity degeneracy and the fact that free sites tend to "push" electrons towards attractive sites.

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