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Off-diagonal disorder in two-dimentional attractive Hubbard model: A Bogoliubov-deGennes study SANJEEV KUMAR, Indian Institute of Science Education and Research (IISER) Mohali, PRABUDDHA CHAKRABORTY, Indian Statistical Institute (ISI) Chennai — We present a detailed computational study of the two-dimensional attractive Hubbard model on a square lattice in the presence of off-diagonal disorder. The focus is on the superconductor to insulator transition, and on the comparison between the effects of diagonal disorder and those of off-diagonal disorder. We decouple the attractive Hubbard model in the pairing channel and make use of the Bogoliubov deGennes methodology to study the resulting model numerically on finite lattices. The work is motivated by recent observation of Anderson localization in optical lattices, and the possibility of tuning the sign of interactions between the atoms [Rev. Mod. Phys. **80**, 885 (2008)]. We find very interesting qualitative differences between the models of diagonal and off-diagonal disorder. The average amplitude of superconducting order parameter and spectral gap are strongly suppressed with off-diagonal disorder. This is in contrast to the case of diagonal disorder, where the spectral gap has a minumum and the amplitude of superconducting order parameter remains finite. We also present systematic lattice-size dependence of results. In addition, we compare the results of binary (discrete), and box (continuous) distributions, for both diagonal and off-diagonal disorder models.

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