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Spin selective localization transition in disordered interacting system in two dimensions: A quantum Monte-Carlo study SHASHI KUNWAR, Indian Inst of Tech-Madras, PRABUDDHA CHAKRABORTY, Indian Statistical Institute Chennai, RAJESH NARAYANAN, Indian Inst of Tech-Madras — The phenomenon of Anderson localization wherein non-interacting electrons are localized by quenched impurities is a subject matter that has been extremely well studied. However, localization transition under the combined influence of interaction and quenched disorder is less well understood. In this context we study the localization transition in a two-dimensional Hubbard model under the influence of a spin-selective disorder i.e, disorder which is operational on just one of the spin-species. The model is analyzed by laying recourse to a Quantum Monte Carlo based scheme. Using this approach we show the possibility of a metal-insulator transition. However, we will show that this metal-insulator transition is extremely sensitive to the filling-fraction inherent in the system. Our results will be encapsulated in a phase diagram.

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