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Phase separation and electron pairing in repulsive Hubbard clusters ARMEN KOCHARIAN, Department of Physics and Astronomy, California State University, GAYANATH FERNANDO, TUN WANG, KALUM PALANDAGE, Department of Physics, University of Connecticut, JIM DAVENPORT, Computational Science Center, Brookhaven National Laboratory — The exact numerical diagonalization in ensemble of small Hubbard clusters reveal pairing fluctuations, Bose condensation and charge-spin separation in the ground state and finite temperatures [1,2]. The phase diagram off half filling strongly suggests existence of subsequent transitions from electron pairing into unsaturated ferromagnetic and saturated ferromagnetic Mott- Hubbard like insulators driven by electron repulsion. Rigorous criteria for occurrence of corresponding quantum critical points and crossover temperatures are formulated. The phase diagram for 2×4-site clusters illustrates how these features are scaled with cluster size. The phase separation and electron pairing monitored by magnetic field and electron doping surprisingly resemble phase diagrams in family of doped high T_c cuprates. [1] Phys. Rev. B 74, 024511, [2] (2006) cond-mat/0608579 (2006)

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