ON THE PHASE DIAGRAM OF
THE ZERO-BANDWIDTH HUBBARD MODEL
WITH INTERSITE MAGNETIC INTERACTIONS

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In this report we have analyzed a simple effective model for a description of magnetically ordered insulators. The Hamiltonian considered consists of the effective on-site interaction (U) and the intersite Ising-like magnetic exchange interaction (J) between nearest neighbours. For the first time the phase diagrams of this model have been determined within Monte Carlo simulation on 2D-square lattice. They have been compared with results obtained within varational approach, which treats the on-site term exactly and the intersite interactions within mean-field approximation. We show that, depending on the values of interaction parameters and the electron concentration, the system can exhibit not only homogeneous phases: (anti-)ferromagnetic (F) and nonordered (NO), but also phase separated states (PS: F–NO).

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