

THE ROLE OF THE EXCHANGE INTERACTION IN THE ONE-DIMENSIONAL n -COMPONENT HUBBARD MODEL

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The commensurate p/q -filled n -component Hubbard chain was investigated by bosonization and high-precision density-matrix renormalization-group analysis. It was found that depending on the relation between the number of components, n , and the filling parameter, q , the system shows metallic or insulator behavior, and for special fillings bond ordered (dimerized, trimerized, tetramerized etc.) ground state develops in the insulating phase [1]. In the sense of the applied mean-field approximation one can conclude that this bond ordering is a direct consequence of the spin-exchange interaction, which plays a crucial role in the one-parameter Hubbard model — not only for infinite Coulomb repulsion, but for intermediate values as well.

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13.4 cm

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9.7 cm