

Asymmetric diamond Ising-Hubbard chain with attractive interaction

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The ground state and the thermodynamics of an asymmetric diamond Ising-Hubbard chain [1, 2] with the attractive on-site interaction of electrons are considered. This chain is exactly solvable by means of the decoration-iteration transformation. In the case of the antiferromagnetic Ising interaction the effect of the attractive interaction on the ground state and the temperature dependence of the magnetization, magnetic susceptibility, and specific heat is investigated.

Temperature curves of the magnetization and magnetic susceptibility are shifted by an increase of the attractive interaction similarly to their behavior by an decrease of the Coulomb on-site repulsion [2]. For some values of the model parameters (attractive interaction, hopping amplitude, asymmetric of the Ising interaction), the temperature dependence of the zero-field specific heat has an additional low-temperature peak.

References

- [1] M.S.S. Pereira, F.A.B.F. de Moura, and M.L. Lyra, Phys. Rev. B 77, 024402 (2008).
- [2] B.M. Lisnii, Low Temp. Phys. 37, 296 (2011).