2D Falicov-Kimball model in the perturbative regime at finite-temperatures

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Finite-temperature properties of the Falicov-Kimball model have been studied in the perturbative regime, i.e. for $t/U \ll 1$, where $t = 1$ is the hopping constant and $U = 10$ denotes the Coulomb interaction strength. In our study, we have determined the phase diagram of the model in the second-order of the perturbation theory, where the antiferromagnetic Ising model in the magnetic field emerges. In the fourth-order, where our model constitutes the Ising model with more complicated frustrated antiferromagnetic interactions,the phase diagram was established. The Monte Carlo method was employed to investigate the phase transition lines. The existence of stripe ordering at finite temperatures is proved.

9.7 cm

◄———————————— 13.4 cm ————————————►

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