

# Scalar-Interchange Potential and Magnetic/Thermodynamic Properties

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By means of numerical simulations, we explore possible influence of geometric deformations on magnetic graphene-like systems. As an efficient and economic method to take the geometrical effects into account, in addition to the electromagnetic interaction, we introduce an extra interaction transmitted by a massive scalar, associated to the Kekulé deformations. As a result, one meets a new potential interaction term, which affects the properties of the nano-surface. Monte Carlo analysis enables one to analyze the behavior of the system under variation of the external magnetic field, of the temperature, and also on the inverse of the mass of the extra scalar boson, which characterizes the typical length scale of geometric deformations. Our analysis is based on the spin configurations and includes evaluating magnetization, magnetic susceptibility and the specific heat in the presence of the Kekulé-induced new potential.