## A gauge theory approach to a generalized Hubbard model

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## Abstract

We present a gauge-invariant reformulation of the Hubbard model, which assumes a set of arbitrarily chosen local spin quantization axes. This way, the macroscopic spin angular degrees of freedom are described by gauge fields. An effective interaction between fermions, with a long-range confining potential, is thus obtained. We compute the ground state energy of the gauged model in the one-dimensional version, for a classical configuration of the gauge sector. It is shown that gauge fields contribute to stabilize the antiferromagnetic configuration. A brief discussion on possibilities unveiled by this formulation is also given.