

Abstract Submitted
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Long Range Order in Orbital Model WENLONG YOU, GUANGSHAN TIAN, HAIQING LIN, Department of Physics, The Chinese University of Hong Kong, Shatin, N. T., Hong Kong — We investigate the existence of Néel type long range order (LRO) in an orbital model which is highly anisotropic and frustrated. The model originated from magnetic materials such as LaMnO_3 where orbital degrees of freedom play important role. In the system described by the two-fold degenerate e_g orbitals, due to the Kugel-Khomskii superexchange, the orbital degrees of freedom are represented by quantum pseudo-spin $1/2$ operators. By applying the reflection-positivity method developed by Dyson, Lieb, and Simon, and adopting appropriate numerical variational method to obtain good estimations on the energy density and correlation functions, we are able to rigorously prove the existence of long range order in this orbital model on the square lattice.

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