Stripe Charge Ordering in Triangular-Lattice Systems

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We investigate ground-state properties of a $t_{2\mathrm{g}}$-orbital Hubbard model on a triangular lattice at hole density 0.5 by using the Lanczos diagonalization. In the paramagnetic phases, we observe in common that one or two orbitals among three orbitals become relevant due to the effect of orbital ordering. For instance, e'_{g} orbitals are active when $a_{1\mathrm{g}}$ orbital is fully occupied. In such a situation, since the symmetry of e'_{g} matches well with the triangular lattice, characteristic spin-charge-orbital structure is expected to appear. Then, we study an effective e'_{g}-orbital model and find charge-stripe structure composed of ferromagnetic/antiferro-orbital chains. Namely, the spin frustration is removed due to charge ordering. We also discuss spin-charge-orbital structure for the case of other combinations of relevant orbitals.

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