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Ground state properties of the ionic Hubbard model on a two-leg triangular ladder at 3/4 filling IVÁN GONZÁLEZ, Centro de Supercomputacion de Galicia — We study numerically the ionic Hubbard model on a two-leg triangular ladder at 3/4 filling. This model is believed to be the minimal microscopic model describing the physics of Na_xCoO_2 at $x = 0.5$, and shows a rich phase diagram that depends on a delicate balance between the Coulomb interaction U, the hopping amplitude t, and the ionic potential Δ. Motivated by experiments analyzing the dopant distribution on $Na_{0.5}CoO_2$, we focus in the case of a stripe-type ionic potential. In the correlated limit where the Coulomb interaction is large, the ground state of the model is a charge-transfer insulator for large ionic potential and turns metallic for zero ionic potential. Electronic structure calculations point to the regime $\Delta \sim |t|, t < 0$ as the one relevant for $Na_{0.5}CoO_2$, but previous calculations [1] have not fully clarify the nature of ground state of the model in such regime. The aim of this work is to study the metal-insulator transition that occurs in the region $U \gg \Delta \sim |t|$ of the phase diagram as well as the magnetic and charge structures of the associated ground states.
[1] J. Merino et al. Phys. Rev. B 80, 045116 (2009).

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