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Single-particle excitation-spectra in the Hubbard model on a kagomé lattice WATARU KOSHIBAE, NEJAT BULUT, KENJI TSUTSUI, SADAMICHI MAEKAWA, Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan — The effects of frustration in spin systems have been studied for many years. Recently, the transport properties of the layered cobalt oxide Na_xCoO_2 and of related oxides have generated new interest in the frustrated systems. In the cobalt oxides, the Co ions form a triangular lattice. The hopping matrix element of electrons in the cobalt $3d$ orbitals is not isotropic, and we have shown [PRL**91**, 257003] that the triangular CoO_2 lattice consists of four coupled kagomé sublattices. For this reason, here, we examine the single-particle excitation spectrum of the Hubbard model on the kagomé lattice, and study the motion of a carrier in this frustrated system. We use the quantum Monte Carlo and the exact-diagonalization methods. The dispersion relation of the tight-binding model on the kagomé lattice has a flat dispersion at the top or the bottom of the energy band depending on the sign of hopping-matrix element t. This causes a two-fold degeneracy at the Γ point where the flat piece of the dispersion is located. However, in the interacting system, we find that the lowest- lying states have a two-fold degeneracy at the Γ point independent of the sign of t, when the Coulomb repulsion is sufficiently strong. In this talk, we will discuss these numerical results on the electronic structure of the Hubbard model on the kagomé lattice.

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