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Photo-doped carrier dynamics in Mott insulatoring systems EIKI IYODA, SUMIO ISHIHARA, Department of Physics, Tohoku Univ., JST-CREST — Electron/hole doping in Mott insulators, for example two-dimensional cuprates, has been well investigated in relation to high-Tc superconductivity. Especially related to photo-doping, many experiments on photo-induced phase transition in strongly correlated systems have been made. In the usual photo-doping setup, the system is excited with fs-laser pulse and generated electron-hole pairs affect properties of materials. Recently, another type of photo-doped experiment with heterostructure has been made, and hole or electron carriers are dynamically injected through the heterostructure. In this theoretical study, we examine photo-doped carrier dynamics in the t-J model with dynamically doped holes. We formulate dynamics of the carriers by non-equilibrium Green functions. We take an initial state of holes and decompose the non-equilibrium Green's function into a series of equilibrium Green's functions by using Wick's theorem. The effect of the initial distribution appears from the higher terms in the series. We treat magnons with the self-consistent Born approximation. The non-equilibrium Green function derived in this way shows double time dependence. We will present physical quantities in transient process, for example, one-particle excitation spectra for holes.

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