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Photo-irradiation effect on charge-ordered states in strongly correlated electron systems YU KANAMORI, Department of Physics, Tohoku University, HIROAKI MATSUEDA COLLABORATION, SUMIO ISHIHARA COLLABORATION — Photo-induced phenomenon has attracted much attention in the research field of strongly correlated electron systems. Recently, the photo-induced effects have been examined experimentally in a charge-ordered (CO) insulating phase associated with the antiferromagnetic (AF) order in perovskite manganites, and changes in the charge and magnetic properties are observed. It is believed that strong coupling between itinerant electrons and localized spins plays a key role on the phenomena. We investigate photo-induced effects in correlated electron systems where conduction electrons couple with localized spins. In particular, the photo-induced phenomena in a CO insulator associated with AF order are examined. Several transient spectra are calculated numerically in the double exchange model. We find that in the photo-excited states, finite spectral weights in the optical absorption spectra appear inside of the insulating gap, and its intensity increases with increasing time. In the one-particle excitation spectra, the in-gap band appears by the photo-irradiation, and its width becomes broad with time evolution. These electronic-structure changes are correlated with the time evolution of the localized spin correlation. These results indicate that the spin degree of freedom plays an important role on the photo-excited states.

Yu Kanamori
Department of Physics, Tohoku University

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