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Photoinduced charge and spin dynamics in strongly correlated electron systems HIROAKI MATSUEDA, SUMIO ISHIHARA, Tohoku University — It is widely recognized that the competition among multiple phases is a key issue to understand electronic properties in strongly correlated electron systems. A tiny amount of external perturbation breaks balance among these phases, and gigantic response appears. Photoirradiation by the femtosecond pulse laser is a powerful tool to induce the response. For understanding the mechanism of the response after the photoirradiation, pump-probe spectroscopy measurements on perovskite manganese oxides have been performed in recent years. The main issue is the photoinduced transition between ferromagnetic metallic and charge-ordered insulating (COI) phases. Motivated by the transition, we examine the effect of the photoirradiation on the COI phase in the extended double-exchange model. We calculate the transient optical absorption spectrum by the density matrix renormalization group method. The COI once goes to a metallic state, and the metal tends to go back to the initial COI. The antiferromagnetic spin correlation of the localized spins in the ground state is greatly suppressed. Possible scenarios for photoinduced ferromagnetism are discussed.

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