

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Strong light-field effects in correlated organic conductors.
SHINICHIRO IWAI, YOHEI KAWAKAMI, YOTA NAITOH, HIROTAKE ITOH,
SUMIO ISHIHARA, Tohoku University, KENJI YONEMITSU, Chuo University
— Optical responses of organic conductors have attracted much attentions, because they exhibit ultrafast solid-state phase transitions in the conducting and/or dielectric natures upon photo-excitations. In this decade, photoinduced melting of correlated insulators with clear charge gap have been extensively investigated. On the other hand, optical responses of correlated metal has not been studied well. Here, we describe a charge localization induced by the 9.3 MV/cm instantaneous electric field of a 1.5 cycle (7 fs) infrared pulse in an organic conductor α -(bis[ethylenedithio]-tetrathiafulvalene) $_2$ I $_3$. A large reflectivity change of 30 percent and a coherent charge oscillation along the time axis reflect the opening of the charge ordering gap in the metallic phase. This optical freezing of charges, which is the reverse of the photoinduced melting of electronic orders, is attributed to the 10 percent reduction of t driven by the strong, high-frequency electric field. Furthermore, the contribution of Coulomb repulsion will be discussed on the basis of the polarization dependence of the pump light and the theory.

Shinichiro Iwai
Tohoku University

Date submitted: 07 Nov 2015

Electronic form version 1.4