Ultrafast photoinduced phenomenon
in charge ordered \(\beta^-\) (BEDT-TTF)(TCNQ)

N. Fukazawa,1 T. Ishikawa,1 Y. Okimoto,1 S. Koshihara,1,2
K. Onda,1 H. M. Yamamoto,1,4 and R. Kato3
1Tokyo Tech., 2-12-1, Oh-okayama, Meguro-ku, Tokyo, Japan,
e-mail: fukazawa.n.aa@m.titech.ac.jp, 2JST-CREST, Japan,
3RIKEN, Japan, 4JST-PRESTO, Japan

Single crystal of \(\beta^-\) (BEDT-TTF)(TCNQ) was synthesized as
the 3rd type of (BEDT-TTF)(TCNQ).[1] In this crystal, charge
ordered (CO) state is realized in BEDT-TTF layer of this crystal at
room temperature and ambient pressure. With lowering
temperature, the CO state disappears at about 170K and a metallic
state appears gradually. Similar phase transition is also caused by
an application of external pressure (about 2 kbar).[2] These results
indicate that the electronic state of this compound is located on the
verge of the phase boundary.

Considering these results, we started pump probe time resolved
spectroscopic studies of the CO state in \(\beta^-\) (BEDT-TTF)(TCNQ)
by using fs laser system with 120fs-pulse width. As a result, we
observed ultrafast reflectivity change. The maximum value of the
reflectivity change in the mid IR region can reach about 60% at
room temperature. The result of time resolved reflectivity spectra
suggests that the amplitude of the charge ordering is weaken in the
photoinduced metastable state.

REFERENCES