Photoinduced Insulator to Metal Transition in Charge-Ordered BEDT-TTF Salts
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Recently, persistent photocurrent with assisted electric field has been observed in α-(BEDT-TTF)$_2$I$_3$ at charge-ordered state [1]. The photocurrent having two conducting states was observed by pulsed laser irradiation under electric field at 4 K (Fig.). The first conducting state stands up during pulse width (~5 ns) and is comparable in magnitude to metal state at high temperature. This indicates that the charge order is melted by photo excitation less than 5 ns and photoinduced insulator-to-metal transition occurs. The second conducting state is maintained after photo irradiation under electric field.

In this study, we have achieved observation of the persistent photocurrent with assisted electric field in (BEDT-TTF)$_3$(ClO$_4$)$_2$, (BEDT-TTF)$_5$Te$_2$I$_6$ and θ-(BEDT-TTF)$_2$RbZn(CNS)$_4$ (fast cooling) at charge-ordered state. The details of the results and the mechanism of the photocurrent will be discussed.