M(dmit)₂ (M=Pd, Pt) salts show an unique phase transition due to the strong electron-phonon and electron-electron correlations [1]. We reported the optical spectral change induced by the photoexcitation in the charge separated (CS) phase of the Et₂Me₂Sb[Pd(dmit)₂]₂ single crystal [2]. Recently, A[Pt(dmit)₂]₂ (A=Me₄P, Me₄As and Me₄Sb) are crystalized and studied by transport and X-ray crystallographic technique [3]. The Pt(dmit)₂ system also shows the CS phase with relatively higher transition temperature thanks to the relatively weaker dimerization of the Pt(dmit)₂ than Pd(dmit)₂ molecules. To investigate the photoinduced phenomena in this Pt(dmit)₂ salt is interesting for application as well as unveiling the mechanism of phase transition based on CS mechanism by virtue of the freedom of molecular orbital.

We measured the pump-probe type time-resolved spectroscopy using the fs-pulsed regenerative amplifier system and found the large photoinduced change of the reflectivity and its relaxation processes as shown in figure 1. We are now measuring the dynamics of the structural change directly using a time-resolved electron-diffraction technique. I would like to present the photoinduced dynamics of the Pt(dmit)₂ system both from the crystallographic and spectroscopic viewpoints.

[References]