Graphene shows diverse novel physical properties arising from its peculiar electronic states, so-called Dirac electrons. Especially, effect of magnetic field is very unique, exhibiting exotic Landau level (LL) splitting. LLs are substantially modified by spins of Dirac electrons and pseudo-spins. The degeneracy of LLs is lifted to show splitting by electron-electron interaction and by the Zeeman effect. We investigated the magneto-optical absorption of graphene subjected to ultra-high magnetic field. Samples were prepared by the CVD method deposited on GaAs and Quart substrate. We have confirmed existence of graphene on each substrate by the micro-Raman spectroscopy. Next, we conducted magneto-absorption measurements in magnetic field up to 120 T by the single-turn coil (STC) method. We could observe absorption peak at 65 T and 100 T, respectively, probably arising from the LL inter-band transitions.

**Keywords:** Graphene, Magneto-absorption, Landau level