

This work deals with magneto-optical measurements using a recently built prototype of a two-dimensional electromagnet. In the first stage, an experimental setup for magneto-optical measurements was constructed, which enables to study Voigt effect and magnetic linear dichroism. In the second stage, this setup was tested by measuring hysteresis loops in a sample of ferromagnetic semiconductor GaMnAs. In the final stage, we performed a new type of magneto-optical experiments, which fully exploits the two-dimensional control of the magnetic field generated in the electromagnet.