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Interaction of laser radiation with plasma under the MG external magnetic field[1] V. V. IVANOV, University of Nevada, Reno, A. V. MAXIMOV, Laboratory for Laser Energetics, University of Rochester, NY 14623, USA, R. BETTI, Department of Physics and Astronomy, University of Rochester, NY 14623, USA, H. SAWADA, Y. SENTOKU, University of Nevada, Reno — Strong magnetic fields play an important role in many physical processes relevant to astrophysical events and fusion research. Laser produced plasma in the MG external magnetic field was studied at the 1 MA pulsed power generator coupled with the laser operated in ns and ps regimes. Rod loads and coils under 1 MA current were used to produce a magnetic field of 2-3 MG. In one type of experiments, a 0.8 ns laser pulse was focused on the load surface with intensity of $3x10^{15}$ W/cm^2. Laser diagnostics showed that the laser produced plasma expands in the transversal magnetic field and forms a thin plasma disc with a typical diameter of 3-7 mm and thickness of 0.2-0.4 mm. A magnetosonic-type wave was observed in the plasma disc and on the surface of the rod load. The plasma disc expands radially across the magnetic field with a velocity of the order of the magnetosonic velocity. Physical mechanisms involved in the formation of the plasma disc may be relevant to the generation of plasma loops in sun flares. Other experiments, with a 0.4 ps laser pulse were carried for investigation of the isochoric heating of plasma with fast electrons confined by the strong magnetic field. The laser beam was focused by the parabola mirror on a solid target in the magnetic field of the coil.

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