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Hydrodynamic instabilities in interaction of laser radiation with a magnetized target SERGEI V. RYZHKOV, BMSTU, VICTOR KUZENOV, A.Yu. Ishlinsky IPM RAS — Laser-driven magneto-inertial fusion (MIF) allows to compress the preseeded magnetic field to thousands of teslas. Model of high pulse energy laser target interaction is presented. Richtmyer-Meshkov (R-M) instability is investigated for MIF systems. We have shown that there is a possibility to suppress the R-M instability by magnetic field. Modeling the impact of magnetic field on a single plasma jet formed at the ICF laser target compression is performed. It is shown that at the compression and heating of a plasma target by using a rapidly growing external magnetic field and laser radiation the R-M instability can be suppressed. Analysis of two-dimensional disturbances and composed structures, corresponding to the "irregular" regime is presented. We introduce the basic dimensionless parameters defining the solution of the problem. The NICA (Nonstationary Instruments and Codes for fusion Applications) code is developed and tested. Preliminary test results of magnetized plasma target compression by high energy laser pulses are shown. It can be argued that the magnetic field in terms of vortices plays a stabilizing role, which is manifested in the fact that the vortex structures dissipate in the presence of an externally applied magnetic field.

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