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This book consists of the abstracts of plenary, oral and poster contributions to the XXXII International Conference on Interaction of Intense Energy Fluxes with Matter (March 1–6, 2017, Elbrus, Kabardino-Balkaria, Russia). The reports deal with the contemporary investigations in the field of physics of extreme states of matter. The conference topics are as follows: interaction of intense laser, x-ray and microwave radiation, powerful ion and electron beams with matter; techniques of intense energy fluxes generation; experimental methods of diagnostics of ultrafast processes; shock waves, detonation and combustion physics; equations of state and constitutive equations for matter at high pressures and temperatures; low-temperature plasma physics; physical issues of power engineering and technology aspects.

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Chapter 1. Power Interaction with Matter

Hydrodynamic model of interaction of laser radiation with deuterium–tritium target

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In this work, the hydrodynamic model of two-temperature plasma in conditions of inertial fusion is considered. The system of hydrodynamic equations with the counts of kinetic phenomena (viscosity, thermal conductivity and the temperature difference between ions and electrons) the radiation transfer equation and beam of heavy ions are calculated. In the framework of the model based on the hydrodynamic system, the results of several numerical experiments, the study of which is substantive interest, are considered: (i) shock wave propagation in spherical geometry for two temperature plasma; (ii) the impact of high-power laser pulse on a target, confining a mixture of deuterium and tritium; (iii) the impact of heavy ion beam at a hot dense plasma bunch. In the first problem important role play the electron conductivity and discrepancies between ions and electrons temperatures on the front of shock waves. In the second problem the compression of deuterium-tritium mixture due to the expansion of the outer shell is considered. An important role is played by the wave of electron thermal conductivity and the shock wave propagating inside the target. In the third problem the heating of dense hot plasma bunch by beam of heavy ions is considered. This research was funded under the target program No. 0115PK03029 "NU–Berkeley strategic initiative in warm dense matter, advanced materials and energy sources for 2014–2018" from the Ministry of Education and Science of the Republic of Kazakhstan.