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The model of energy transport in turbulent laser plasma of porous targets.

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To achieve a high gain in laser thermonuclear targets, deuterium-tritium (DT) fuel should be compressed $10^4 - 10^5$ times with respect to its initial density. For this purpose, spherical targets are irradiated by a large number of laser beams (with average intensity $10^{14} - 10^{15}\ W/cm^2$), aimed at a uniform irradiation of the target surface and, as a consequence, a uniform heating of its outer layers. In practice, a 100A low density porous cover on the target could smooth these perturbations. A number of laser fusion laboratories carry out the studies of power laser pulse interaction with low density porous targets.

We propose a physical-mathematical model of energy transport in turbulent plasma of porous target irradiated by laser pulse. 2D numerical simulations have been made with help of Lagrange code “ATLANT” [1]. A good agreement between numerical results and experimental data from “PALS”-facility (Prague Asterix Laser System, Czech republic) has been got [2]. Using this model it has been possible to explain some challenging phenomena, which have been observed at “PALS” experiments.

We have discussed of the opportunity to observe the vortex structures in such plasma with help of the electron bunch scattering on spontaneous magnetic fields [3].

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