VALUE AND INFLUENCE OF TWO DIMENSIONAL EFFECTS UNDER THE NUMERICAL MODELLING OF AN ACTION BY A LASER ACCELERATED IMPACTOR UNTO A PLANE TARGET [[1]](#footnote-1)\*)

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Currently, the problems of interaction of laser-accelerated plates with solid-state targets are being actively investigated experimentally and theoretically. In such experiments, in the corresponding numerical calculations, it becomes possible to experimentally determine the thermophysical characteristics of the substances under study. Laser exposure, with a properly arranged absorber (in particular, a low-density, porous absorber is often used in order to best convert the energy of the laser pulse into the created ablative pressure [1]) provides acceleration of the striker to speeds of tens of km / s and the resulting pressures of several megabars. Such conditions are quite enough to study the physics of the so-called "dense warm matter". A considerable number of works are devoted to this direction. Publications [1-3] can be considered one of the last ones containing a large amount of information. At the same time, numerical studies of recent years have been based, as a rule, on 1D, flat calculations. This approach, however, gave quite definite characteristics of the densities, pressures, velocities of motion of substances behind the shock wave obtained in the experiment, etc. However, recently, the question of the multidimensional nature of the interaction of the striker with the target has become fundamental. The values of pressure, density of substances obtained in one-dimensional (flat) calculations, and their other characteristics, will not change taking into account the inhomogeneity of the impact. Here there is also the influence of the distribution of the intensity of laser radiation in the transverse plane, and the effect of the spread of heated matter on the sides of a flat target, In the proposed work we tried to simulate the effects of the spread of matter to the sides in the conditions of a plane collision of plates (a striker-target). The simulation was carried out on the basis of the numerical NUT code [4] in the cylindrical version. The effect of the transverse expansion was evaluated, and, as it turned out, it is not noticeably significant.

References

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/L/It/ru/DT-Zmitrenko.docx) [↑](#footnote-ref-1)