the specifics of compression and combustion of shock-ignited inertial fusion targets [[1]](#footnote-1)\*)

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Shock-ignited inertial fusion targets are studied by one-dimensional and two-dimensional numerical simulations. Investigations were performed for laser pulse on 2-nd and 3-rd harmonic irradiation from Nd-laser. Shock-ignition [1] involves the impact on the target of a traditional design in the form of a thin two-layer spherical shell containing a layer of DT-ice and an ablator CH, a laser pulse whose power increases according to a special law that provides a partial separation of the compression and ignition processes of the target at a sufficiently high degree of energy accumulation due to the collision of divergent (reflected from the center) and converging (incendiary) shock waves.

Parameters of targets and a laser pulse of the 2-nd and 3-rd harmonics of Nd-laser were found which at shock ignition scheme can achievement of gain factor about 100, several times higher than at traditional spark ignition have been defined.

The results of compression and ignition the proposed targets of shock-ignition in violation of the homogeneity of heating due to various factors of violation of symmetry of irradiation for the two typical cases of low and high dominant modes of perturbations were performed. The first case relates to the factors of regular violation of the uniformity of irradiation due to the small number of laser beams and the shift of the target from the center of chamber, the second - the factors of stochastic violation of the uniformity of irradiation associated with the imbalance of the energy in laser beams, the miss of beams relative to the center. It was determined that characteristics of the compression and combustion of the target in the scheme of hydrocarbon ignition are more sensitive to the misalignment parameters of target and laser pulse compared to spark ignition.

References

1. **V.A. Shcherbakov, Sov. J. Plasma Phys. 9,240 (1983).**
1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVII/It/ru/CE-Yakhin.docx) [↑](#footnote-ref-1)