

RESEARCH OF THE MODEL OF LASER RADIATION ABSORPTION IN POSTCRITICAL ZONE WITH USE OF FINITE-ANALYTICAL METHOD TO HELMHOLTZ EQUATION

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The paper discusses a mathematical model of absorption of laser radiation in post-critical zone for numerical simulations of beginning process of target evaporation in the presence of sharp boundary of type “metal-vacuum”.

In the paper analyzed model formally divided into two parts in the stage of laser radiation ray tracing: calculation of the ray trajectory by the law of geometric optics and energy distribution in post-critical electron density zone in the moment of reflection from edge of the zone according to laws of wave optics. The paper research the second stage of ray tracing, namely, existence of dependence on chosen scale and mesh of absorption and reflection coefficients, acquired in the second stage with use of one-dimensional Helmholtz equation.

The paper provides the results of numerical simulation, verifying efficiency of the model element, which compute energy absorption in post-critical zone. In the paper qualitative correspondence was shown with obtained analytical solution for the case of finite zone with homogeneous profile of dielectric permittivity.
