

# Processes of preplasma formation to increase the efficiency of laser radiation sources

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Femtosecond laser pulses are used to generate various radiations and to accelerate particles. The efficiency of radiation sources depends on the parameters and scales of the plasma with which the short pulse interacts. The plasma is usually created by a nanosecond prepulse, which precedes the femtosecond pulse. Control of such a prepulse, or the use of an additional synchronized laser source, makes it possible to control the preplasma and, accordingly, the efficiency of laser energy into radiation conversion. This paper presents a numerical model that allows to calculate the forming preplasma. The model is used to study the process of preplasma formation from a nanosecond prepulse (intensities  $10^{11}$ – $10^{13}$  W/cm<sup>2</sup>) for irradiation of thick and thin targets. For a thin target, its deflection is observed, which affects the flow of the medium. The influence of various physical processes on the parameters of preplasma is discussed.