Diploma thesis abstract

Extreme states of thermally thin metal films induced by nanosecond laser pulses.

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In this paper we presents the results of our studies of high-energy (near-critical) states of metals with temperature being of the order of 10 kK and pressure being of the order of 10 kbar. These states are excited by firing nanosecond laser pulses with intensities up to 1 GW/cm^2 (fluence up to 6 J/ cm^2) onto a metal surface loaded with a transparent dielectric. Usage of the loaded surface considerably increases the efficiency of temperature and pressure generation.

Usage of thermally thin metal films allows simultaneous measurements of temperature, pressure and density dynamics of the sample under study; i. e. it allows to obtain full information regarding its thermodynamic state and trace its path on a phase plot.

This method was used to study aluminum films loaded with K8 glass.

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