

STUDYING THE OPTICS OF SHOCK WAVE COMPRESSED WARM DENSE MATTER

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The development of the theory of warm dense matter determines the need to obtain experimental information about the physical properties of the object under study for a wide range of variation of the thermodynamic parameters up to extremely high. This condition assumes the use of powerful shock waves in physical experiments. At the same time, studying the optics of a dynamic object is a good research tool, since the optical properties of the matter are very sensitive to changes in its electronic subsystem.

The results of new experiments on the optics of warm dense matter are presented. The polarized reflective properties of dense plasma in the near-infrared and visible regions of the spectrum are studied.

The thermodynamic parameters including the composition of the plasma were determined from the measured shock wave velocity in connection with appropriate equation of states using the Saha IV code [1]. During the experiments, the plasma densities $\rho = 0.85 \text{ g/cm}^3$, pressure up to $P = 6 \text{ GPa}$ and temperature up to $T = 31000 \text{ K}$ were realized.

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1. Gryaznov V. K., Iosilevskiy I. L. and Fortov V. E. // AIP Conf. Proc. 2012. V. 917 P. 1426.