

The investigation of opto-polarizing properties of shock-compressed warm dense matter

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Experimental data from study of optics of shock-compressed plasma is an important cornerstone to construct theoretical models for the description of warm dense matter. Analysis of the response of a dense plasma to the action of an electromagnetic wave can be used as a tool for investigating the validity of physical models describing the behavior of matter under extreme conditions, high temperatures and pressures.

Within this work, the new experimental data on oblique incidence of polarized electromagnetic wave, are presented. The optical properties of strongly correlated plasma were studied in the near-infrared and green spectral regions at a plasma mass density $\rho = 0.82 \text{ g/cm}^3$. The composition and thermodynamic parameters of the plasma were determined using the modified Saha IV code [1, 2], taking into account the measured velocity of the shock wave in the gas, the equations of states of the gas cell material and the gas under study. The spatial parameters of the plasma transition layer are determined based on the numerical solution of the field equations.

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