

Experimental research of properties of femtosecond laser nonideal plasma

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The new method of femtosecond time-resolved interferometric microscopy for studying properties of nonideal plasma is developed.

The use of Fourier transform technique allows to receive the information on change of the module and phases of complex reflectivity with high accuracy. The dynamics of these parameters was investigated by using pump-probe technique with femtosecond time resolution.

The experiments were made by using TW Cr: forsterite laser system with laser pulse time duration ≈ 100 fs and intensity $10^{12} \div 10^{14}$ W/cm². The wavelength of pump pulse – 1240 nm, probe pulse – 620 nm.

For the first time the experimental data on dynamics of complex reflection coefficient of nonideal plasma in subpicosecond time scale were obtained. Comparison of experimental data with modeling results gives the important information about transport factors and absorption ability of nonideal plasma.