MICROWAVE DOPPLER DIAGNOSTICS OF SHOCK-COMPRESSED ARGON PLASMA

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Using the method of microwave diagnostics [1] based on radiointerferometers with wavelengths of 3.2 and 2.1 mm, the kinematic and electrophysical characteristics of plasma of shock-compressed argon initially located at atmospheric pressure were studied. The study was carried out in the pressure range from 12 MPa to 62 MPa and shock wave velocities from 3.1 km/s to 6.6 km/s. The obtained data on the kinematic parameters agree with the known data and the calculation from the modified Van der Waals model [2]. An array of reflection coefficients of electromagnetic radiation was obtained at the wavelengths of 3.2 and 2.1 mm from a shock wave front on whose basis the electron conduction and the electron density in the shock wave front were estimated. The experimental data are consistent with the calculation of the modified Van der Waals model in the velocity range D=3.1-3.6 km/s. With the further enhancement of velocity a phenomenon of constancy of a reflection coefficient was observed.

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