

Measurement of microparticles number density in a high-velocity aluminum jet by Mie scattering

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The light scattering effect of a spherical particle (Mie scattering) is used as a diagnostic method to measure the size of particles ejected from a surface when a shock wave come out onto the surface [1]. An interesting object for study is a high-velocity cumulative jet created by an explosive generator with toroidal compression of a cylindrical envelope [2, 3]. In this work, Mie scattering is used to measure the particle number density and specific mass of particles in a two-phase high-speed aluminum jet propagating in a vacuum. The jet was probed by laser radiation with a wavelength of 650 nm in the direction perpendicular to the jet velocity vector. Estimates were made of the possible influence of the residual atmosphere in the assembly on the measurement result.

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