Investigation of parameters of polydisperse medium using neural networks for processing digital holograms

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One of the most informative ways to investigate parameters of aerosol and polydisperse medium is holography. In the case of high-density aerosols reconstructed images includes a lot of noise and information about the particles. Manual processing of such a great amount of information about the size and quantity of the particles is just impossible. In this work it is presented results of investigation of polydisperse medium using mathematical modeling of holographic methods of registration and neural networks for processing digital images. Neural network for determining of the size was trained on the modeling spherical particles with the size 5-50 microns. Verification was carried out on the holograms registered during shock impact on the surface with the particles. In the result it is showed opportunity of semi-automatic determination of the particles, and their classification through their size. Concentration of the particles was about 1 million per cubic centimeter.