

Abstract Submitted  
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**Digital Holographic Microscopy for Dispersed Flows.** KHALED SALLAM, Oklahoma State University — Measuring the velocity field of a dispersed flow (e.g. bubbly flows, sprays, particle-laden flows) is of major importance in many industrial applications. Particle Image Velocimetry techniques are limited to 2-dimensional measurements. The present study involved extension of the existing holographic PIV method to two-phase flow velocimetry. The objective of the present study was to conduct velocity measurements using in-line holographic microscopy arrangement to analyze dispersed flows including an air bubble rising through stagnant water in a rectangular column, and spray injected in gaseous crossflow. Seeding particles (hollow glass spheres) are scattered uniformly in the continuous phase and are used as seed particles for the case of bubbly flow. Double-pulsed holograms recorded on 2K by 2K pixels CCD sensor capture the three-dimensional motion of the particles (in the continuous phase) and that of the dispersed phase itself. The holograms are reconstructed into ‘slices’ and analyzed using image-processing algorithms to yield information about the sizes and velocities of the particles.

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