

Abstract Submitted  
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**Multi-camera PIV imaging in two-phase flow for improved dispersed-phase concentration and velocity calculation** CHANG LIU, KEN KIGER, Dept. of Mech. Engr., Univ. of Maryland — PIV/PTV has been widely used in making simultaneous measurements of velocity and concentration within multi-phase flows. A major problem confronted by researchers during data processing is to separate the image signals of the dispersed phase from carrier phase reliably and within the same measurement volume. For dilute concentrations, size and brightness criteria have been shown to provide satisfying results in identifying the dispersed phase. However this method is limited to fairly small concentrations due to effects of multiple-scattering and obscuration. To extend this technique, we introduce multi-camera imaging as a means to provide a more precise and reliable identification of the dispersed phase in the face of increased concentration. Specifically, the size-brightness criteria is used to nominally match corresponding dispersed-phase images of the same particle within the other views, and the subsequent out-of-plane position is used to get a more precise 3D location of the particle. In order to demonstrate this method, experiments using static test cell of solid glass sphere suspended in an aqueous gel have been conducted under various concentration and compared to corresponding single camera results.

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