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**Bubble size measurements in a bubbly wake**<sup>1</sup> ASHISH KARN, JIARONG HONG, CHRISTOPHER ELLIS, ROGER ARNDT, University of Minnesota — Measurements of bubble size distribution are ubiquitous in many industrial applications. Conventional methods using image analysis to measure bubble size are limited in their robustness and applicability in highly turbulent bubbly flows. These flows usually impose significant challenges for image processing such as a wide range of bubble size distribution, spatial and temporal inhomogeneity of image background including in-focus and out-of-focus bubbles, as well as the excessive presence of bubble clusters. This talk introduces a multi-level image analysis approach to detect a wide size range of bubbles and resolve bubble clusters from images obtained in a turbulent bubbly wake of a ventilated hydrofoil. The proposed approach was implemented to derive bubble size and air ventilation rate from the synthetic images and the experiments, respectively. The results show a great promise in its applicability for online monitoring of bubbly flows in a number of industrial applications.

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