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Session A15: Experimental Techniques: Bio and Multiphase Measurements

8:00 AM–9:57 AM, Sunday, November 20, 2022

Room: 143

Chair: Roni Goldshmid, Caltech; Kenneth Kiger, University of Maryland

Abstract: A15.00002 : Large Scale Volumetric Flow Measurements using Air-Filled Soap Bubbles*

8:13 AM–8:26 AM

← Abstract →

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Coarse-grained volumetric flow measurements at large scales are relevant to

numerous biological and industrial applications, but pose a scaling challenge for conventional techniques suited to controlled experimental settings. Here we present a three-dimensional particle tracking velocimetry (PTV) system suitable for volumes on the order of 10^2 meters cubed using

air-filled soap bubbles and high-resolution DSLR cameras. Air-filled soap bubbles are attractive

tracer particles due to high light scattering efficiency, near neutral buoyancy, and ease of production.

The low-cost instrumentation, detailed measurement protocols, and open-source processing software are

discussed along with limitations for increasing accessibility to non-specialist users. Preliminary analyses of

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