

Abstract Submitted
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Temporally resolved 3D3C velocity measurements using confocal volumetric scanning STEVEN KLEIN, Mechanical Engineering, Arizona State University, JONATHAN POSNER, Mechanical Engineering, Chemical Engineering, Arizona State University — A diagnostic platform for measuring three dimensional velocity fields in whole microscopic volumes is presented. The imaging system is based on Nipkow spinning disk confocal microscopy. The confocal system provides optical sectioning using pinhole spatial filtering which rejects light originating from out of focus objects. Volumetric scanning is obtained by rapid translation of the high numerical aperture objective using a piezo stage. High speed optical sectioning and volumetric scanning of microscopic volumes can be used for real time visualization and velocimetry of three dimensional micro flows in applications such as 3D3C particle tracking velocimetry (PTV) and volumetric quantitative fluorescence imaging. Temporally resolved 3D3C velocity measurements of microchannel flow are presented at near video rates (10-20 Hz) using the scanning confocal system. Little post processing is required because only a single objective is used and no complex algorithms are needed to recover the depthwise velocity component nor to reconstruct the particle images.

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