

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Spinning Disk Confocal microPIV of Unstable Non-dilute Electrokinetic Flows STEVEN KLEIN, JONATHAN POSNER, Mechanical Engineering Arizona State University — Flow velocity is measured in microscale flows using microPIV and a Nipkow spinning disk based confocal microscope. The confocal system provides for optical sectioning thinner than 500 nm which allows for rejection of light originating from out of focus particles. Out of focus light in standard microPIV typically results in depth averaging, poor SNR, and the inability to measure unsteady flows. Spinning disk confocal imaging provides depth resolved imaging, high SNR images with increased particle volume fractions, and imaging rates of 200 frames per second (limited by the CCD). In this work, two velocity components are measured in a volume in a steady pressure driven flow. The system is also applied to measuring two components of velocity of unstable electrokinetic flows in non-dilute colloidal suspensions.

Steven Klein
Mechanical Engineering Arizona State University

Date submitted: 01 Aug 2007

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