

Abstract Submitted  
for the DFD11 Meeting of  
The American Physical Society

**Near wall velocity measurement of nanofluids using evanescent wave based PIV technique**<sup>1</sup> ANOOP KANJIRAKAT, REZA SADR, Texas A&M University at Qatar — Recently nanofluids, dilute suspension of nano particles in a based fluid, have emerged as a possible candidate as a coolant in variety of applications based on some reports of enhanced conductivity for these fluids. However, there are controversies in the reported properties of nanofluids and their applicability's, specially, since there is no fundamental understanding explaining these enhancements. A better understanding of these fluids and how they interact with the solid boundary is achieved by detailed near wall fluid flow study at nano scale. In this work nanofluids of different concentrations are prepared by dispersing silicon dioxide particles (10-20nm) in water as the base fluid. Pressure driven nanofluids flow inside a micro channel is studied by adding fluorescent polystyrene particles of 100nm to the flow. Nano Particle Image Velocimetry (nPIV) is used to measure near-wall velocity fields with an out of plane resolution of less than 250nm. The measured near wall velocity field is then compared with that of the basefluid at the same condition. Initial observations have shown that nPIV techniques can be successfully extended for nanofluids for better understanding the flow characteristics in the near wall region.

<sup>1</sup>This work was supported by QNRF.

Anoop Kanjirakat  
Texas A&M University at Qatar

Date submitted: 05 Aug 2011

Electronic form version 1.4