

Abstract Submitted  
for the DFD14 Meeting of  
The American Physical Society

**Flow rate and slip length measurements of water in single micrometer pipes** PETER TABOREK, ANERUDH KANNAN, DAVID MALLIN, ANGEL VELASCO, University of California, Irvine — Measurements of pressure driven water flows in hydrophobic and hydrophilic fused quartz capillaries of 1.8  $\mu\text{m}$  diameter are compared. Typical flow rates of 1 picoliter/s and pressure drops up to 25 Atm were used. Water exited the capillaries into an oil reservoir where the volume of the pendant drop could be monitored using time lapse photography. The typical growth rate for the drop diameter was  $\sim 300 \mu\text{m}$  per day. The drop size saturates due to diffusion at the interface. For the untreated quartz capillary the results are consistent with a slip of zero. The hydrophilic capillaries are chemically treated with octadecyltrichlorosilane (OTS) to form hydrophobic surfaces. Successful surface preparation is confirmed with the absence of capillary rise. Our technique can detect slip lengths above 20 nm.

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Date submitted: 31 Jul 2014

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