Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

**Slippage of water past superhydrophobic carbon nanotube forests in microchannels** PIERRE JOSEPH, CECILE COTTIN-BIZONNE, JEAN-MICHEL BENOIT, CHRISTOPHE YBERT, University Lyon I, CATHERINE JOURNET, University Lyon I, PATRICK TABELING, ESPCI, Paris, LYDERIC BOCQUET, University Lyon I — We present an experimental characterization of liquid flow slippage over superhydrophobic surfaces made of carbon nanotube forests, incorporated in microchannels. We make use of a $\mu$-PIV (Particule Image Velocimetry) technique to achieve the submicrometric resolution on the flow profile necessary for accurate measurement of the surface hydrodynamic properties. We demonstrate boundary slippage on the Cassie superhydrophobic state, associated with slip lengths of a few microns, while a vanishing slip length is found in the Wenzel state, when the liquid impregnates the surface. Varying the lateral roughness scale $L$ of our carbon nanotube forest-based superhydrophobic surfaces, we demonstrate that the slip length varies linearly with $L$ in line with theoretical predictions for slippage on patterned surfaces.

Lyderic Bocquet
University Lyon I

Date submitted: 26 Jul 2006 Electronic form version 1.4