Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Climbing of Micro-Droplets Along a Conical Fiber ERQIANG LI, SIGURDUR THORODDSEN, KAUST — When a droplet is deposited onto a conical cylinder the spatial variation of capillary pressure makes it travel up the cone away from the tip. We use high-speed video imaging to observe the motion of micro-droplets along very small conical glass fibers. The results are compared to the pioneering work of Lorenceau & Quéré (2004) who used much larger cones. Our glass cones are made using a micro-pipette glass-puller, producing cone diameters down to about 5 micron at their tips. Numerous liquids, e.g. silicone oils, water and methanol were tested, to vary the viscosity over a range of 2000 and the surface tension over a factor of 3. Translations velocities from 0.1 to over 200 mm/s have been observed and the velocity follows capillary-viscous scaling. We find that there exists an optimum aspect ratio of the droplet shape for fastest motion.

Erqiang Li
KAUST

Date submitted: 02 Aug 2011 Electronic form version 1.4