Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Characterization of Surface Nanobubbles SHANGJIONG YANG, STEPHAN DAMMER, HAROLD ZANDVLIET, STEFAN KOOIJ, BENE POELSEMA, DETLEF LOHSE, Physics of Fluids, University of Twente, PHYSICS OF FLUIDS, UNIVERSITY OF TWENTE TEAM, SOLID STATE PHYSICS, UNIVERSITY OF TWENTE COLLABORATION — In this work we characterize surface nanobubbles on hydrophobic surface in water by Atomic Force Microscopy (AFM) operated in the tapping mode. A connection between the formation of nanobubbles and the surface topography is presented. Together with large contact angle of nanobubbles, which determines their shape, the surface topology may support the surprising stability of nanobubbles. It is shown that the properties of the nanobubbles and their density are sensitive to the gas concentration and type. We show that different surface treatments also influence nanobubbles in formation and shape. Next, adding surfactants (2-butanol) causes nanobubbles to shrink, as expected from the Laplace equation. Finally, we show that exchanging alcohols by water on the surface strongly encourages the formation of nanobubbles.

Shangjiong Yang
Physics of Fluids, University of Twente

Date submitted: 10 Nov 2006 Electronic form version 1.4