

Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Early growth of condensing water droplets on a superhydrophobic surface YONGFANG ZHONG, ANTHONY JACOBI, JOHN GEORGIADIS , Department of Mechanical Sci. and Eng., University of Illinois — Water droplets placed on dry superhydrophobic surfaces have very large contact angles and very small critical inclination angles, making their behavior especially interesting. However, very few systematic investigations are available on the behavior of droplets condensing on such surfaces. We report on the early growth of water droplets condensing from humid air on a cooled superhydrophobic surface created with a micro-post surface topology. The evolution of individual droplets is monitored via confocal microscopy as they nucleate between and on the micro-posts, grow and coalesce. A model is developed to investigate the effect that surface micro-topography has on the configuration of a condensing droplet, and the model indicates that the post aspect ratio determines whether a condensing droplet will fill the cavity between posts or span adjacent posts. Further study of condensing water droplets on cooled substrates with a variety of designed micro-structures is underway.

Yongfang Zhong
Department of Mechanical Sci. and Eng., University of Illinois

Date submitted: 07 Aug 2006

Electronic form version 1.4