Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

In situ, noninvasive characterization of superhydrophobic coatings[1] G.C. TEPPER, M.A. SAMAHA, H. VAHEDI TAFRESHI, M. GAD-EL-HAK, Virginia Commonwealth University — Light scattering was used to measure the time-dependent loss of air entrapped within a submerged microporous hydrophobic surface subjected to different environmental conditions. The loss of trapped air resulted in a measurable decrease in surface reflectivity and the kinetics of the process was determined in real time and compared to surface properties, such as porosity and morphology. The light-scattering results were compared with measurements of skin-friction drag, static contact angle, and contact-angle hysteresis. The *In situ*, noninvasive optical technique was shown to correlate well with the more conventional methods for quantifying surface hydrophobicity, such as flow slip and contact angle. *In situ* characterization of submerged hydrophobic surfaces using light scattering represents a new and useful tool for real-time estimation of hydrophobicity and drag reduction.

[1]Financial support from the Defense Advanced Research Projects Agency (DARPA), contract number W91CRB-10-1-0003, is acknowledged.

Mohamed Gad-el-Hak
Virginia Commonwealth University

Date submitted: 16 Jun 2011 Electronic form version 1.4