Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Energy required to lift a water strider's hydrophobic leg out of water DUCK-GYU LEE, Seoul National University, DOMINIC VELLA, University of Cambridge, HO-YOUNG KIM, Seoul National University — Although it is well-known that a water strider's legs are superhydrophobic, the reason for their strong water repellency is still a matter of debate. Cylindrical objects floating on water can support similar maximum load as long as the contact angle is over 90 degrees, which discards the hypothesis of the role of superhydrophobicity in static floating. Here we show that the energy required to lift a water strider's cylindrical leg out of water strongly depends on the wettability. Our theory and experiments reveal that the energy saving achieved by the superhydrophobicity of the legs reaches over 90% as compared with the legs with the contact angle of 90 degrees. This implies that a water strider can jump out of water in emergency with a great ease owing to its legs' strong water repellency.

Ho-Young Kim
Seoul National University

Date submitted: 04 Aug 2007 Electronic form version 1.4