Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Numerical simulations of drop impact on superhydrophobic structured surfaces[1] DAVIDE GUZZETTI, STEFANO LARENTIS, NICOLA PUGNO — During the last decade drop impact dynamics on superhydrophobic surfaces has been intensively investigated because of the incredible properties of water repellency exhibited by this kind of surfaces, mostly inspired by biological examples such as Lotus leave. Thanks to the recent progress in micro-fabrication technology is possible to tailor surfaces wettability defining specific pillar-like structured surfaces. In this work, the behavior of impinging drops on these pillar-like surfaces is simulated, characterizing temporal evolution of droplets contact radius and drop maximal deformation dependence on Weber number. Numerical simulations results are compared with theoretical and experimental results guaranteeing simulation reliability. Fingering patterns obtained from drop impact has been studied obtaining a correlation between number of fingers and Weber number. Drop fragmentation pattern obtained from simulations supports the proposed correlation. Different drop impact outcomes (e.g. rebound, fragmentation) on structured superhydrophobic surfaces are simulated, focusing on the influence of micro-structured surface geometrical pattern. This investigation is relevant in order to define design rules for possible reliable non wettable surfaces.

[1]Financial support by Alta Scuola Politecnica

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Date submitted: 05 Aug 2011 Electronic form version 1.4