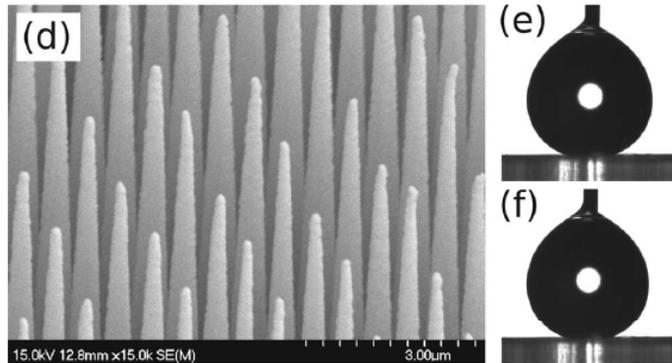


Drag Reduction with Superhydrophobic Surfaces

Modeling and Simulation Group

Computational Sciences & Engineering Division



Problem Statement:

- Hydrodynamic drag reduction has always been of great interest since it can effectively reduce energy consumption and increase performance in a broad range of applications. With recent advances in nanotechnology, new smart materials described as superhydrophobic have been shown to be capable of reducing drag over a large range of fluid regimes. However, drag reduction trends of these materials are not well understood in turbulent regimes.

Technical Approach:

- A new generation of superhydrophobic surfaces optimizing drag reduction in turbulent regimes was designed and will be fabricated in 2011.
- Direct Numerical Simulations are being performed for these materials and numerical tools to accurately predict the drag reduction of superhydrophobic materials in turbulent regimes are being developed.

Benefit:

- CSED research results could make a critical contribution to several industry applications such as pipelines, cooling systems, irrigation systems, naval transportation, and many others.

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