

Abstract Submitted  
for the DFD17 Meeting of  
The American Physical Society

**Simulating condensation on microstructured surfaces using Lattice Boltzmann Method**<sup>1</sup> ALEXANDER ALEXEEV, YAROSLAV VASYLIV, Georgia Institute of Technology — We simulate a single component fluid condensing on 2D structured surfaces with different wettability. To simulate the two phase fluid, we use the athermal Lattice Boltzmann Method (LBM) driven by a pseudopotential force. The pseudopotential force results in a non-ideal equation of state (EOS) which permits liquid-vapor phase change. To account for thermal effects, the athermal LBM is coupled to a finite volume discretization of the temperature evolution equation obtained using a thermal energy rate balance for the specific internal energy. We use the developed model to probe the effect of surface structure and surface wettability on the condensation rate in order to identify microstructure topographies promoting condensation.

<sup>1</sup>Financial support is acknowledged from Kimberly-Clark.

Yaroslav Vasyliv  
Georgia Institute of Technology

Date submitted: 07 Aug 2017

Electronic form version 1.4