



The Hong Kong University of Science and Technology

Department of Mathematics

Seminar on Applied Mathematics

Numerical simulations of contact-angle hysteresis

by

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Abstract

When a fluid interface slides on a solid substrate, the advancing and receding contact angles may differ, which is known as the contact angle hysteresis. In the phase-field framework, the relation between the microscopic dynamic contact angle and the prescribed equilibrium contact angle is embedded in the chemical potential on the solid wall. Following this observation, we propose a novel boundary condition for contact angle hysteresis by manipulating phase-field wall energy relaxation. Our method identifies pinning, advancing, and receding conditions automatically, without the explicit knowledge of contact-line velocity or contact angle. The same idea can be easily extended to numerical methods other than the phase-field method, as long as the generalized Navier boundary condition is used for contact line motion. We will provide some recent results on contact angle hysteresis from both a phase-field method and a level-set method. Code validations and 3D simulations of sliding drops will be presented.

Date: Wednesday, 19 December 2018
Time: 3:00p.m. – 4:00p.m.
**Venue: Room 4504, Academic Building,
(Lifts 25-26), HKUST**
All are welcome!