Contact of Rough Surfaces : Theory & Practice of Fluids & Solids

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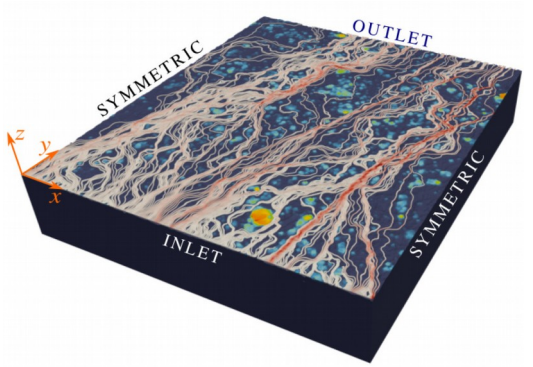

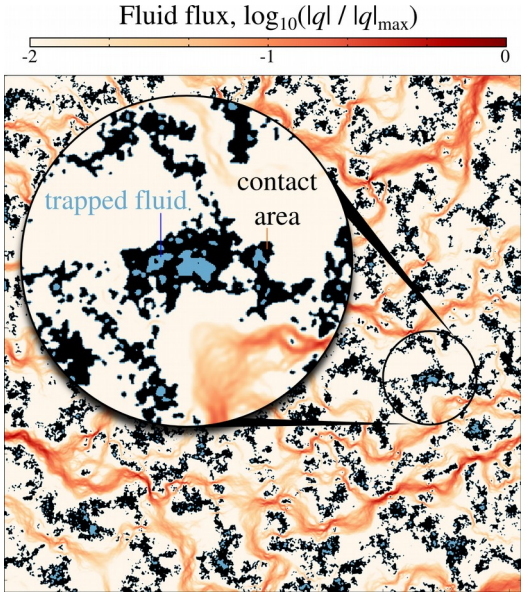

Because of the roughness (inevitably present in most natural and engineering surfaces), when being brought in contact, solids touch over multitude of separate ”islands” forming the true contact area, which in general is considerably smaller than the nominal contact area. The true contact area strongly affects almost all facets of interfacial physics such as stress state, friction, adhesion, wear, and also transport of energy across and transport of mass along the interface. Using advanced numerical simulations, we study how the contact area grows under increasing pressure for different material and roughness parameters. In addition, we address a problem of viscous fluid flow in contact interface and take into account its eventual entrapment. A purely theoretical and idealized vision of this problem is complemented with some practical considerations.

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