

Abstract Submitted
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The Effect of Non-Uniform Wetting Properties on Contact Line Dynamics¹ MORGANE GRIVEL, DAVID JEON, MORTEZA GHARIB, Caltech — Surfaces with non-uniform wetting properties have been shown to modify contact line dynamics and induce passive displacements of shallow flows. These surfaces are patterned with alternating hydrophobic and hydrophilic stripes of a certain width, spacing and orientation. A thin rectangular wall jet impinges on the surfaces and Fourier Transform Profilometry is used to reconstruct the 3D profile of the low to medium Reynolds number flows. Our previous work reported the development of intriguing roller structures at the contact line near hydrophobic-hydrophilic interfaces and the effect of varying the stripes' dimensions and orientation on these flows. Our present work extends the study to the effects of flow rate and plate inclination angle (with respect to the horizontal). The current work also studies air entrainment by the roller structures of the modified contact line. We will also discuss potential uses of this technique for modifying contact line dynamics and bow waves near surface-piercing bodies.

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