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**Characteristic Structure of Forced Wetting** MENGFEI HE, SIDNEY NAGEL, University of Chicago — As a solid plate is lowered vertically into a tank of liquid, the plate will entrain some of the surrounding air. The contact line between the gas, liquid, and solid will be pushed below the original surface height of the liquid. When the dipping velocity surpasses a critical speed, a transition takes place. At that point the contact becomes elongated and, in the final steady state, form a V-shaped cavity of air surrounded on one side by the solid plate and the other side by the liquid [1]. Using interference imaging, we find that there is a characteristic structure to the thickness of the entrained air layer. Not only is there a thick region of air at the edge of the cavity, but there is also characteristic V-shaped regions at the two top corners. The thick region around the edge is reminiscent of the ridge structures observed in dewetting [2]. The non-uniformity of the air pocket geometry suggests a non-uniformity of the air flow distribution, which further suggests a new instability related to the air pocket dynamics.

[1] T D Blake and K J Ruschak, Nature (London) 282, 489(1979)
[2] J H Snoeijer, G Delon, M Fermigier and B Andreotti, PRL 96, 174504(2006)

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