

Abstract Submitted
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Controlling Interfacial Instabilities in Hele-Shaw Cells: Experiments JAKE FONTANA, Liquid Crystal Institute, KSU, PETER PALFFY-MUHORAY, Liquid Crystal Institute, KSU, SHUWANG LI, University of California at Arvine, JOHN LOWENGRUB, University of California at Arvine, LIQUID CRYSTAL INSTITUTE TEAM, UNIVERSITY OF CALIFORNIA AT ARVINE TEAM — The growth of crystals in an undercooled melt and interface evolution in Hele-Shaw cells are governed by similar underlying mathematics. Hele-Shaw experiments can therefore give valuable insights into crystal growth. We have constructed radial Hele-Shaw cells where oil between parallel glass plates could be displaced by air whose injection pressure is a function of time. Here we describe our experimental apparatus and present results for the interface evolution for different driving schemes. We have found that, in agreement with recent theoretical predictions (presented separately in this session), we can prevent the onset of the Saffman-Taylor instability, or we can select and grow a particular unstable mode and drive the interface towards a corresponding universal shape. Varying the injection pressure during growth thus allows control over interfacial instabilities.

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