

Abstract Submitted
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A novel experimental characterization of non-linear pattern growth in the Viscous Fingering Instability SAVANNAH GOWEN, THOMAS VIDABK, SIDNEY NAGEL, University of Chicago — The viscous fingering instability occurs when a low viscosity fluid displaces a higher viscosity fluid within a confined geometry. The interface of the two fluids becomes unstable to the formation of finger like fluid channels. Here we use thin rings of dyed and undyed fluid to visualize the flow field within the Hele-Shaw cell during pattern formation. Using image processing techniques, we are able characterize various aspects of the non-linear interface dynamics and assess these in comparison with simple model predictions. This technique has also inspired insight into the connection between the 2D pattern formation and the fluid structure within the gap.

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