

Abstract Submitted  
for the DFD20 Meeting of  
The American Physical Society

**Fluid-structure interactions in a soft-walled Hele-Shaw cell**<sup>1</sup> CAL-  
LUM CUTTLE, SATYAJIT PRAMANIK, JIAN HUI GUAN, CHRISTOPHER  
MACMINN, University of Oxford — The interaction of viscous and interfacial flows  
with soft materials has recently attracted substantial interest from a variety of dif-  
ferent perspectives. Here, we study these interactions in the context of a model  
problem: Flow in a deformable Hele-Shaw cell, where one wall is rigid and the other  
is soft. Combining experiments with mathematical modelling, we consider the cou-  
pling of flow and deformation as viscous fluid is injected into an initially empty cell.  
We then discuss the implications of these results for hydrodynamic instabilities such  
as viscous fingering.

<sup>1</sup>We acknowledge financial supports from EPSRC EP/P009751/1 and ERC H2020  
805469.

Callum Cuttle  
University of Oxford

Date submitted: 07 Aug 2020

Electronic form version 1.4