

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

A soft porous drop in linear flows YUAN-NAN YOUNG, New Jersey Institute of Technology, MICHAEL MIKSIS, Northwestern University, YOICHIRO MORI, University of Minnesota, MICHAEL SHELLEY, New York University — The cellular cytoplasm consists a viscous fluid filled with fibrous networks that also have their own dynamics. Such fluid-structure interactions have been modeled as a soft porous material immersed in a viscous fluid. In this talk we focus on the hydrodynamics of a viscous drop filled with soft porous material inside. Suspended in a Stokes flow, such a porous viscous drop is allowed to deform, both the drop interface and the porous structures inside. Special focus is on the deformation dynamics of both the porosity and the shape of the drop under simple flows such as a uniform streaming flow and linear flows. We examine the effects of flow boundary conditions at interface between the porous drop and the surrounding viscous fluid. We also examine the dynamics of a porous drop with active stress from the porous network.

Yuan-Nan Young
New Jersey Institute of Technology

Date submitted: 01 Aug 2017

Electronic form version 1.4