

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Behind the Rotating Flattop: when vortex meets a deformable surface J.-C. TSAI, Inst. of Physics, Academia Sinica, Taipei, Taiwan, Y.-C. SUN, National Taiwan Normal University, Taipei, Taiwan, K.-H. HUANG, National Taiwan University, Taipei, Taiwan, C.-Y. LAI, Princeton University, C.-Y. TAO, Inst. of Physics, Academia Sinica, Taipei, Taiwan, J.-R. HUANG, National Taiwan Normal University, Taipei, Taiwan — We study experimentally a two-fluid system, driven by a rotating upper boundary, inside a stationary cylinder. For a range of aspect ratios, the interface displays various changes with driving rates, with the most striking being the formation of a plateau. Direct imaging and flow visualization allow us to identify the interplay between the morphology of our two-fluid interface and the vortex loops reported previously in literatures, in a way that we can rigorously define the transition by the switch of topology in the flow structure rather than just the shape of the free surface. Further extensions of the parameter space show a wealth of phenomena involving various instabilities on the interface that call for further understanding.

J.-C. Tsai
Inst. of Physics, Academia Sinica, Taipei, Taiwan

Date submitted: 01 Aug 2014

Electronic form version 1.4