Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

On the dynamics of air sheet contraction PENG DENG, ZHEN JIAN, MARIE-JEAN THORAVAL, International Center for Applied Mechanics, School of Aerospace, Xi'an Jiaotong University, Xi'an 710049, P.R.China — We have investigated the contraction of a thin air sheet by direct numerical simulations with the open source code Basilisk. An initially stationary thin air sheet starts to contract under capillary force. The contraction dynamics is dominated by the competition between capillary force and viscous dissipation. Three different regimes have been identified as a function of the Ohnesorge number of the sheet. For high Oh ($Oh \gg 1$), viscous effect dominates the dynamics. The rim of the sheet retracts under a nearly constant velocity after a rapid transition. For intermediate Oh ($0.1 < Oh < 1$), the contraction velocity decreases in time under a power-law scaling. For low Oh ($Oh < 0.1$), some vortices are shed behind the rim of the air sheet forcing its vertical oscillations. The air sheet can be even pinched off for smaller Oh ($Oh < 0.01$).

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Date submitted: 02 Aug 2019 Electronic form version 1.4