Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Wind-driven drop depinning on uphill surfaces and with variable contact-angle hysteresis[1] ELEAZAR HERRERA HERNANDEZ, EDWARD WHITE, Texas A&M University — Contact angle hysteresis enables liquid drops to adhere to solid surfaces when surfaces are tilted or the drops are exposed to gas flow. Previous work (2017.DFD.Q11.006) has identified critical depinning Weber numbers at which contact-angle hysteresis is unable to resist forcing. We_{crit} is constant for non-inclined surfaces and varies systematically with Bond number for inclined surfaces. This work continues to investigate and develop a model for critical depinning conditions using tests with different contact angle hysteresis values and negative surface inclinations for which gravity acts in the direction opposite to wind forcing. Results show that under gravity-dominated forcing the surface tension adhesion force is well predicted by the contact angle hysteresis, $\Delta(\cos\theta)_{a,r}$. It is found that surface tension adhesion is more effective under wind-dominated forcing than under gravity-dominated forcing.

[1]Supported by the National Science Foundation through Grant CBET-1839103

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Date submitted: 23 Jul 2019 Electronic form version 1.4