Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Droplet dynamics in a stagnation-point flow[1] ZIH-YIN CHEN, University of Minnesota, ALIREZA HOOSHANGINEJAD, Cornell University, SATISH KUMAR, SUNGYON LEE, University of Minnesota — The application of airflow normal to a droplet-laden substrate is commonplace in drying and cleaning processes that are part of coating and printing applications. Recent studies by Hooshanginejad et al. have demonstrated that a partially wetting droplet can exhibit complex behaviors when subject to a stagnation-point flow of air. Depending on the droplet size, and magnitude and position of the air jet, the droplet is observed to oscillate in place, split into two, or depin from the substrate. In order to rationalize the experimental findings, we build a 2D lubrication model which implements the effects of potential airflow and a moving contact line using a precursor film and disjoining pressure. In this talk, we discuss the theoretical formulation and some preliminary model results in conjunction with the experimental findings.

[1]This study is partially supported by the National Science Foundation through Grant CBET-1839103.

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Date submitted: 02 Aug 2020 Electronic form version 1.4