Abstract Submitted for the DFD19 Meeting of The American Physical Society

**Partial coalescence of a droplet with a pool of different viscosity**<sup>1</sup> ABDULLAH AL ALHARETH, SIGURDUR T. THORODDSEN, King Abdullah University of Science and Technology — The partial coalescence of a drop with a liquid surface is a critical factor during the coarsening of emulsions, as this process can produce smaller droplets. It is well-known that increased liquid viscosity or reduced drop size will eventually stop the satellite pinch-off at a critical Ohnesorge number. On the other hand, similar satellites can be pinched off during the rapid spreading of a drop on a solid surface, if it is strongly hydrophilic. Herein we study this process when the substrate transitions from low to high viscosity liquid, modeled to approach the boundary conditions of a solid. We use miscible silicone oils, with a low-viscosity drop and a large range of pool viscosities up to a million times that of the drop. We observe non-monotonic behavior and as the viscosity increases we see a propensity for second-stage pinch-off1. We connect the observed critical Ohnesorge numbers to the spreading behavior. 1. Zhang, Li & Thoroddsen, Phys. Rev. Lett. 102,104502 (2009).

<sup>1</sup>This work was funded by King Abdullah University of Science and Technology (KAUST) under Grant No. URF/1/2621-01-01.

Abdullah Al Alhareth King Abdullah University of Science and Technology

Date submitted: 01 Aug 2019

Electronic form version 1.4