

Abstract Submitted  
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**A simplified hydrodynamic study of painting** JUNGCHUL KIM, HO-YOUNG KIM, Seoul National University — The use of a paintbrush by mankind is known to have started 2000 BC in the Chinese ancient empire, Jin. Despite the long history of painting, attempts to physically and mathematically understand the process of painting seem sparse so far. Here we consider how paint is applied on a solid surface by studying the behavior of a viscous drop sheared between moving plates simulating a canvas and a paintbrush. Dimensional analysis reveals that the behavior is determined by the Capillary number (a ratio of the viscous force to the surface tension force), the receding contact angle and the drop aspect ratio. We experimentally find three distinct drop behaviors, intact dragging, dripping and spreading, and construct a regime map using the foregoing dimensionless parameters. We also give scaling laws to determine the boundaries on the regime map, which agree well with experiment.

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