

Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

When sticky fluids don't stick: yield-stress fluid drops on heated surfaces BRENDAN BLACKWELL, ALEX WU, RANDY EWOLDT, University of Illinois at Urbana-Champaign — Yield-stress fluids, including gels and pastes, are effectively fluid at high stress and solid at low stress. In liquid-solid impacts, these fluids can stick and accumulate where they impact; this sticky behavior motivates several applications of these rheologically-complex materials. Here we describe experiments with aqueous yield stress fluids that are more 'sticky' than water at room temperature (e.g. supporting larger coating thicknesses), but are less 'sticky' at higher temperatures. Specifically, we study the conditions for aqueous yield stress fluids to bounce and slide on heated surfaces when water sticks. Here we present high-speed imaging and color interferometry to observe the thickness of the vapor layer between the drop and the surface during both stick and non-stick events. We use these data to gain insight into the physics behind the phenomenon of the yield-stress fluids bouncing and sliding, rather than sticking, on hot surfaces.

Brendan Blackwell
University of Illinois at Urbana-Champaign

Date submitted: 01 Aug 2016

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