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**Drops of Yield-Stress Liquid Impacting a Solid Surface**

QIN XU, HEINRICH JAEGER, James Frank Institute and Department of Physics, The University of Chicago — We use high-speed video to investigate the drop impact process for yield-stress fluids under different initial conditions. Unlike Newtonian fluids, the impact dynamics of yield-stress liquids are greatly affected by the their viscoelasticity, which can be attributed to either a surface stress or bulk material properties. To explore these two different mechanisms, we perform impact experiments for two model fluids: liquid metals and particle suspensions, which both exhibit significant yield-stress in rheology. By controlling surface oxidation (for liquid metals) and packing density (for suspensions), we quantitatively vary the yield-stress within several orders of magnitude. In this way, we draw a direct comparison between the two fluids at various impact velocities to clarify the role of different sources of yield stress. Also, we build up an approach to bridge impact dynamics with rheological measurements.

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