

Polymer Drop Impacts

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Non-Newtonian fluids and their interaction with solid substrates is of immense importance in industry and daily life. Previous research by Bergeron *et. al.*¹ has shown that adding small quantities of high molecular weight polymers completely inhibits the repellency of liquids on hydrophobic surfaces, which they attributed to extensional viscosity of the polymer. Recently Zang *et. al.*² showed that bouncing can be recovered if the polymer drop were covered with nanoparticles which poses the question whether the rebound suppression results from rather the change in adhesion of the surface. In our experiments, we explore the modification in the rebound characteristics of polymers drops as it impacts surfaces of different wettabilities and compare them with the behavior of liquid marbles made of polymer drops coated with a powder which suppresses direct liquid-solid contact upon impact. We find that these liquid marbles show no change as compared to a pure water drop, showing that drops with polymer can bounce, and thus highlighting the role of adhesion of the surface.

[1] V. Bergeron, *et. al.* Nature 2000, 405 (6788), 772–775.

[2] D. Zang, *et. al.* Appl. Phys. Lett. 2014, 105 (23), 231603.