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Bouncing Droplets on Elastic, Superhydrophobic Cantilever Beam GAURAV UPADHYAY, VEDANT KUMAR, RAJNEESH BHARDWAJ, Indian Institute of Technology - Bombay — During the past several decades, liquid droplet impact on rigid substrates has been well studied and documented. However, not all substrates surrounding us are rigid, including leaves and insect wings, as a few common examples. In the present study, we have experimentally analysed the impact of a microliter water droplet on superhydrophobic cantilever beams in the range of $30 < We < 76$ (We: Weber number). Thin copper sheets were coated with a commercially available *NeverWet* spray to make it superhydrophobic, and high-speed imaging was used for visualisation. The timescales of droplet and cantilever beams were varied by changing the droplet size and beam length, respectively. It was observed that the overall system dynamics (bouncing of the droplet and oscillations of the cantilever) is dependent on the interplay between the two timescales discussed above. An analogous spring-mass system has been used to account for this coupling and explain the experimental observations. These findings could be utilized to achieve desirable contact times, droplet rebound kinetic energy, the energy transfer to the cantilever beam, and the droplet spreading diameter. The conditions to achieve maximum and minimum of these parameters have been outlined and corroborated by the experimental evidence.

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