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Mechanical vibration of viscoelastic liquid droplets[1] JAMES SHARP, VICTORIA HARROLD, School of Physics and Astronomy, University of Nottingham — The resonant vibrations of viscoelastic sessile droplets supported on different substrates were monitored using a simple laser light scattering technique. In these experiments, laser light was reflected from the surfaces of droplets of high Mw poly acrylamide-co-acrylic acid (PAA) dissolved in water. The scattered light was allowed to fall on the surface of a photodiode detector and a mechanical impulse was applied to the drops using a vibration motor mounted beneath the substrates. The mechanical impulse caused the droplets to vibrate and the scattered light moved across the surface of the photodiode. The resulting time dependent photodiode signal was then Fourier transformed to obtain the mechanical vibrational spectra of the droplets. The frequencies and widths of the resonant peaks were extracted for droplets containing different concentrations of PAA and with a range of sizes. This was repeated for PAA loaded water drops on surfaces which displayed different values of the three phase contact angle. The results were compared to a simple model of droplet vibration which considers the formation of standing wave states on the surface of a viscoelastic droplet.

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