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Gradient Dynamics Model for Spreading and Coarsening Drops on soft Substrates

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The investigation of the wetting behavior on viscoelastic or elastic substrates is of great interest. On this poster we present a simple model for liquid drops on fully compressible elastic substrates and show that, besides the double transition of steady drops, also dynamic features are captured quantitatively. In particular we investigate the visco-elastic braking effect, i.e. the increase of dissipation in the substrate with increasing softness, on the example of a spreading drop and show that the scaling laws of a Kelvin-Voigt material [1] are correctly recovered for partially wetting fluids. Beyond that, we explored the coarsening behaviour of two drops and large drop arrays respectively and found that the prevalence of the modes crucially depends on the substrate softness.

[1] S. Karpitschka, A. Pandey, L. A. Lubbers, J. H. Weijs, L. Botto, S. Das, B. Andreotti, and J. H. Snoeijer. *Liquid drops attract or repel by the inverted Cheerios effect*.

Proc. Natl. Acad. Sci. U. S. A., 113:7403–7407, 2016. doi:10.1073/pnas.1601411113.

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