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Dynamics of a sessile drop exposed to a surface acoustic wave

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This talk focuses on the experimental, theoretical, and computational study of the dynamics of a thin silicon oil drop driven by the forcing resulting from applied surface acoustic wave (SAW) applied to the underlying substrate. Our experiments consider a drop spreading either on a flat substrate or on a substrate with a superimposed topology and serve as a test for the theoretical model and related simulations. The model itself starts from the first principles and introduces the forcing due to SAW into the standard long-wave formulation. The novel findings include some rather unexpected features of the resulting model that shed new light on the existing models that have been around for decades. Finally, our simulations allow for discussion of the influence of SAW on the time-dependent drop evolution in a fully nonlinear regime. We conclude by discussing similarities and differences between experimental and theoretical/computational results and possible directions for future work.

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