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Comparison of Simulated and Measured Fluid-Surface Oscillation Frequencies in a Channel[1] MATTHEW TRAPUZZANO, KIESHA PIERRE, EMRE TUFEKCIOGLU, RASIM GULDIKEN, ANDRES TEJADA-MARTINEZ, NATHAN CRANE, Univ of South Florida — Many important processes from agriculture to manufacturing depend on the wetting of fluids on rough or textured surfaces. This has traditionally been studied from a macro-perspective. The effects of these surface features can be dramatically altered by vibrations that overcome energy barriers to contact line motion caused by surface roughness. In order to study these effects in confined geometries and at different length scales, a validated model is required. This presentation will compare the measured and simulated frequencies of capillary vibrations in a cylindrical glass tube. Fluid surface vibrations are excited externally through deformation of the interface. The resulting surface oscillations are observed with a high speed video camera and the dominant oscillation frequencies are calculated. The measured oscillation frequencies are compared to predictions from transient CFD simulations across a range of interface diameters from 400 um to 1.5 mm. These results may be used to inform studies of wetting under vibration.

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