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A Computational Study of the Rheology and Structure of Surfactant Covered Droplets JOAO MAIA, ARMAN BOROMAND, SAFA JAMALI, Case Western Reserve University — The use of different types of surface-active agents is ubiquitous practice in different industrial applications ranging from cosmetic and food industries to polymeric nano-composite and blends. This allows stable multiphasic systems like foams and emulsions to be produced. Stability and shelf-life of those products are directly determined by the efficiency of the surfactant molecules. Although the effect of molecular configuration of the surface-active molecules on the planar interfaces has been studied both experimentally and computationally, it remains challenging to track the efficiency and effectiveness of different surfactant molecules on curved interfaces. In this study we address this gap by using Dissipative Particle Dynamics, to study the effectiveness and efficiency of different surfactant molecules (linear vs. branched) on a curved interface in equilibrium and far from equilibrium. In particular, we are interested to relate interfacial properties of the surface covered droplets and its dynamics to the molecular configuration of the surface active molecules under equilibrium and far from equilibrium condition.

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