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Modeling Coarsening Induced Foam Drainage Using the Arbitrary Lagrangian Eulerian Method ANDREW BRANDON, Lycoming College, RAMAGOPAL ANANTH, Naval Research Laboratory — In this presentation, we will explore coarsening induced foam drainage. Coarsening is the process by which a foams average bubble size increases over time due to diffusion of dissolved gas. Through bubble surface movement, coarsening induces drainage and these two processes are capable of altering the foams properties. Current models have explained some aspects of these coupled processes, but there remain questions that these foam-scale models cannot answer. To address some of these questions, we have created a bubble-scale Arbitrary Lagrangian Eulerian model of an idealized, coarsening foam. Drainage is captured by solving the Navier-Stokes equations over the foams liquid domain and bubble interface movement is described by equations derived to govern the exchange of gas between bubbles. With this model, we have studied the impact that assuming constant film thicknesses (the distance between bubbles) in the coarsening equations can have on drainage. This assumption is typical in current foam-scale models. In this presentation, we will show that allowing the film thicknesses to vary results in a better representation of coarsening induced drainage.

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