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Towards Modeling Local Foam Drainage Using the Arbitrary Lagrangian Eulerian Method ANDREW BRANDON, RAMAGOPAL ANANTH, Naval Research Laboratory — Liquid drainage in foams is a multi-scale, multi-dimensional phenomena that is tied directly to how well a foam performs. For example, the amount of metal within a metal foam after it solidifies affects the strength of the foam and the amount of liquid within an aqueous fire fighting foam determines how effective it is at extinguishing a fire. Liquid drainage is driven by gravity and is governed by the liquid's density and viscosity as well as the surface tension at the liquid gas interface. There are numerous one dimensional, single phase models that approximate liquid drainage by employing a global description but there are no multidimensional models that use a local description. In this presentation, I will describe an ongoing effort to develop a two dimensional, multiphase, Arbitrary Lagrangian Eulerian model for the study of local liquid drainage in foams. I will present an improved algorithm for the solution of the incompressible fluid equations in the Arbitrary Lagrangian Eulerian method, the novel method used for moving the domain in time, and results from this model development effort.

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