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Multiscale computations of thin films between colliding drops BAHMAN ABOULHASANZADEH, University of Notre Dame, SADEGH DABIRI, Purdue University, GRETAR TRYGGVASON, University of Notre Dame — In multiphase flows thin films frequently appear between fluid blobs colliding with each other. These films can become very thin and be difficult to resolve accurately in numerical simulations, particularly in DNS of many co-flowing drops, requiring very fine resolution and resulting in excessive computational cost due to very fine uniform grids or time consuming adaptive mesh refinement. Here, we describe an algorithm for detecting thin films using a front tracking method. We propose a subscale model to describe the physics and the evolution of a thin film between two drops. We also demonstrate the importance of correctly reconstructing the viscosity field on getting a grid independent solution. Comparison between results for a fully resolved film on a fine grid and simulations using a much coarser grid plus the model for the description of the film, show good agreement. This study was funded by NSF Grant CBET-1132410.

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