Multiscale computations of thin films between colliding drops[1]
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— 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 also propose a subscale model to describe the physics and the
evolution of a thin film between two drops. 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, shows good agreement.

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