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(sussman@math.fsu.edu), Florida State University, Department of Math, Tallahassee, FL 32306,
and **Trevor Helms** and **Marco Arienti**. *Multiphase flow and Encapsulation simulations using
the moment of fluid method.*

A moment of fluid method is presented to study incompressible flows involving more than two materials. This work is an extension of Jemison et al (JCP, 2014) in which they presented a moment of fluid method for simulating two-phase flows. For the present method the interfaces between different phases are captured using the moment of fluid method, a directionally split cell integrated semi-Lagrangian method is used to calculate interface and momentum advection, a projection method is used to calculate pressure, and a block structured adaptive mesh refinement method is used to locally increase the resolution in the regions of interest. Various multiphase problems, including problems illustrating contact line dynamics, triple junctions, and encapsulation are studied using the new method in order to demonstrate its capabilities. Examples are given in 2D, 3D axisymmetric (R-Z), and 3D (X-Y-Z) coordinate systems. (Received January 20, 2015)