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Axisymmetric study of drop interface impact in viscous flow XI-
AOMING ZHENG, Central Michigan Univ, JOHN LOWENGRUB, University of
California at Irvine — This work studies the effects of Reynolds number and Weber
number on the rebounding phenomena in the drop/interface impact problem in a
viscous flow. A drop falls through a viscous liquid and then impacts a liquid interface
at the bottom. The drop may break to a ring in the falling process. In the impact,
the drop may rebound or coalesce on contact. In this numerical study, we assume
the drop falling and impacting processes are axisymmetric. We use axisymmetric
finite element level-set method and adaptive mesh to solve the Navier-Stokes equa-
tions to simulate this process. After extensive parameter studies, we find that there
is a range of Weber numbers dependent on the Reynolds numbers, within which the
drop rebounds, below which the drop would coalesce directly with interface, and
above which the drop may break into a ring.

Xiaoming Zheng
Central Michigan Univ

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