

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Film thickness between a bubble and the inner wall of vertical tubes containing viscous liquids GUADALUPE GUTIERREZ, ABEL LOPEZ-VILLA, ABRAHAM MEDINA, National Polytechnic Institute — We study numerically the film thickness in between the free surface of a bubble and the inner wall in a vertical tube filled with a viscous liquid. The computations were performed using the Boundary element method to solve the Stokes equations and a fourth order Runge-Kutta scheme to build the bubble shape. After the computation of the bubble shape, the thickness of the annular film was calculated for low Bond numbers and a wide range of Capillary numbers, Ca . For the case Ca close to zero (inviscid approximation) it is found that the film actually touches the wall, meanwhile for the viscous cases always there is a film of finite thickness.

Abraham Medina
National Polytechnic Institute

Date submitted: 03 Aug 2012

Electronic form version 1.4