3D Microbubble Dynamics in a Weakly Viscous Fluid Near a Rigid Boundary Subject to Ultrasound

Authors : K. Manmi, Q. X. Wang

Abstract : This paper investigates microbubble dynamics subject to ultrasound in a weakly viscous fluid near a rigid boundary. The phenomenon is simulated using a boundary integral method. The weak viscous effects are incorporated into the model through the normal stress balance across the bubble surface. The model agrees well with the Rayleigh-Plesset equation for a spherical bubble for several cycles. The effects of the fluid viscosity in the bubble dynamics are analyzed, including jet development, centroid movement and bubble volume.

Keywords : microbubble dynamics, bubble jetting, viscous effect, boundary integral method

Conference Title : ICFMTE 2014 : International Conference on Fluid Mechanics and Thermal Engineering

Conference Location : Paris, France

Conference Dates : September 22-23, 2014