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Bubble Oscillations under Forced Vibrations MOHAMMAD MOVASSAT, NASSER ASHGRIZ, MARKUS BUSSMANN, University of Toronto — Dynamics of a gas bubble in a liquid container in response to forced vibrations is studied. A 3D two-fluid solver is employed to study the bubble behavior. Forced vibration induces an oscillatory buoyancy force on the bubble. In response to the forcing, bubble undergoes both oscillatory translational motion as well as shape deformation. As the amplitude and frequency of oscillations increase, the bubble response goes from a regular and linear behavior to a chaotic and nonlinear region in which large deformations occur and different shape modes are excited. As the forcing increases, the inertia force, due to the momentum of the surrounding liquid, starts to form a liquid jet within the bubble core. Surface tension force may not be strong enough to prevent the formation and penetration of the jet and the liquid jet may pierce the bubble forming a toroidal bubble shape with a liquid core in the middle.

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