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**Rapid Evaporation of microbubbles**[1] JITENDRA GAUTAM, ASGHAR ESMAEELI, Southern Illinois University at Carbondale — When a liquid is heated to a temperature far above its boiling point, it evaporates abruptly. Boiling of liquid at high temperatures can be explosive and destructive, and poses a potential hazard for a host of industrial processes. Explosive boiling may occur if a cold and volatile liquid is brought into contact with a hot and non-volatile liquid, or if a liquid is superheated or depressurized rapidly. Such possibilities are realized, for example, in the depressurization of low boiling point liquefied natural gas (LNG) in the pipelines or storage tanks as a result of a leak. While boiling of highly heated liquids can be destructive at *macroscale*, the (nearly) instantaneous pace of the process and the release of large amount of kinetic energy make the phenomena extremely attractive at *microscale* where it is possible to utilize the released energy to derive micromechanical systems. For instance, there is currently a growing interest in micro-explosion of liquid for generation of micro bubbles for actuation purposes. The aim of the current study is to gain a fundamental understanding of the subject using direct numerical simulations. In particular, we seek to investigate the boundary between stable and unstable nucleus growth in terms of the degree of liquid superheat and to compare the dynamics of unstable and stable growth.

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