Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Coalescence cascade of bubbles FENGHUA ZHANG, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, PETER TABOREK, Department of Physics and Astronomy, University of California, Irvine, California, USA, SIGURDUR THORODDSEN, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia — Coalescence of two bubbles produces satellite bubbles, known as partial coalescence. The coalescence of the satellite with the main bubble may produce even smaller satellites, so that the coalescence proceeds like a cascade. While the coalescence cascade of a drop has been well known, we show here for the first time that bubbles can do so too. By performing experiments using high-speed imaging and the non-dimensional analysis, the sizes and formation time of the generated satellites are characterized and explained. In addition, we have observed satellites formation at focusing of multiple waves for the first time, as well as formation of several sub-satellites. The conditions of their formation are identified. These findings are important for multi-phase fluid flows, like foams or emulsions, separation of immiscible fluids, printing and painting, etc.

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Date submitted: 03 Aug 2012 Electronic form version 1.4