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Inviscid Partial Coalescence from Bubbles to Drops F.H. ZHANG, Singapore-MIT Alliance, National University of Singapore, Singapore, P. TABOREK, Department of Physics and Astronomy, University of California, Irvine, California, USA, J. BURTON, James Franck Institute, University of Chicago, Chicago, Illinois, USA, B.C. KHOO, K.M. LIM, Singapore-MIT Alliance, National University of Singapore, Singapore, S.T. THORODDSEN, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia — Coalescence of bubbles (drops) not only coarse the bubble (drop) sizes, but sometimes produces satellite bubbles (droplets), known as partial coalescence. To explore links between the drop and bubble cases, we experimentally study the partial coalescence of pressurized xenon gas bubbles in nano de-ionized water using high-speed video imaging. The size of these satellites relative to their mother bubbles is found to increase with the density ratio of the gas to the liquid. Moreover, sub-satellite bubbles are sometimes observed, whose size is also found to increase with the density ratio, while keeps about one quarter of the primary satellite. The time duration from start of the coalescence to formation of the satellites, scaled by the capillary time, increases with the density ratio too. In addition, as the size ratio of the father bubble to the mother bubble increases moderately, their coalescence proceeds faster and the sub-satellite is prone to form and relatively larger.

Feng Hua Zhang
Singapore-MIT Alliance, National University of Singapore, Singapore

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