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Collapse dynamics of bubble raft under compression[1] CHIN-CHANG KUO, Department of Physics and Astronomy, University of California, Irvine, DEVIN KACHAN, ALEXANDER LEVINE, Department of Physics and Astronomy, University of California, Los Angeles, MICHAEL DENNIN, Department of Physics and Astronomy, University of California, Irvine, DEPARTMENT OF PHYSICS AND ASTRONOMY, UNIVERSITY OF CALIFORNIA, IRVINE COLLABORATION, DEPARTMENT OF PHYSICS AND ASTRONOMY, UNIVERSITY OF CALIFORNIA, LOS ANGELES COLLABORATION — We report on the collapse of bubble rafts under compression in a closed rectangular geometry. A bubble raft is a single layer of bubbles at the air-water interface. A collapse event occurs when bubbles submerge beneath the neighboring bubbles under applied compression causing the structure of the bubble raft to go from single-layer to multi-layer. We studied the collapse dynamics as a function of compression velocity. At higher compression velocity we observe a more uniform distribution of collapse events, whereas at lower compression velocities, the collapse events accumulate at the system boundaries. We will present results that compare the distribution of collapse probability in the experiments to simulations based on a one-dimensional Ising model with elastic coupling between spin elements. Both the experimental system and simulations are excellent models for collapse in a number of complex systems. By comparing the two systems, we can tune the simulation to better understand the role of the Ising and elastic couplings in determining the collapse dynamics.

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Chin-Chang Kuo
University of California, Irvine

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