Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Bubble Breakup in Water: Memory, Oscillations, and the Vertical Direction NATHAN KEIM, SIDNEY NAGEL, James Franck Institute, University of Chicago — Using high-speed video, we have studied scaling and memory of the non-universal singularity at bubble pinch-off. We find that when initial conditions break the cylindrical symmetry of the neck of air,[1] the shape of its cross-section oscillates during its collapse.[2] These oscillations determine how and when the collapse ends in a topological transition. We also report on a new experimental geometry that replaces the air bubble with a second nozzle facing the first. This geometry nearly eliminates both the vertical shape asymmetry of the neck and its upward motion during collapse, and is therefore a simpler case for theory and simulation. It also further demonstrates the independence of dynamics at different heights, and the role of initial conditions.

[1]N.C. Keim et al., Phys.Rev. Lett. **97**, 144503 (2006)
[2]L. Schmidt and W.W.Zhang, abstract submitted to APS DFD 2007

Nathan Keim
James Franck Institute, University of Chicago

Date submitted: 03 Aug 2007 Electronic form version 1.4