

Abstract Submitted  
for the DFD05 Meeting of  
The American Physical Society

**The Static Stability of Supported Capillary Pipes at Zero Bond Number** JORGE A. BERNATE, DAVID B. THIESSEN, PHILIP L. MARSTON, Washington State University — At low Bond numbers it is possible to have long liquid columns whose free surface is stabilized by a solid support structure. The supports considered in this work are a single wire helix and a polygonal array of parallel wires. These supported capillary structures are here referred to as supported capillary pipes (SCPs). The static stability at zero Bond number is determined from the equilibrium branch structure following Lowry and Steen [Proc. R. Soc. London Ser. A **449**, 411 (1995)] and compared with experimental measurements obtained in a Plateau Tank. Stability envelopes for different wire radii and contact angles will be presented, and different factors leading to instability will be discussed. A steady capillary-driven flow with large free surface area can be established that could have applications to two-phase fluid contacting. The maximum stable steady-state flow rate that can be achieved is dictated by the stable range of Laplace pressures the interface can sustain. [Supported by NASA]

David Thiessen  
Washington State University

Date submitted: 04 Aug 2005

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