

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Rapid capillary filling of high aspect ratio helically-supported channels in microgravity¹ MAVERICK TERRAZAS, DAVID THIESSEN, Washington State University — Arrays of capillary channels supported by helical wires may be useful as passive phase separators in microgravity. In particular, we are interested in liquid-filled channels connected by manifolds to a pressure reservoir maintained below ambient pressure to collect and transport droplets from a two-phase flow back to the low-pressure reservoir. This drop capture requires that the entire array along with the manifolds be filled with liquid by connecting them to a pressure reservoir. The priming of an array of 6-mm diameter channels in low-gravity aircraft flights has been demonstrated and shown to be stable in the presence of an exterior, transverse two-phase flow with droplet diameters ranging up to several centimeters. The priming of one or two 6-mm diameter channels with springs of large pitch has been demonstrated in drop-tower experiments as well.

¹Supported by NASA.

David Thiessen
Washington State Univ

Date submitted: 31 Jul 2014

Electronic form version 1.4