

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Multiple equilibria and evaporation in elastocapillary systems KIRAN SINGH, MICHELE TARONI, DOMINIC VELLA, OCCAM, Oxford, TAE-HONG KIM, HO-YOUNG KIM, Seoul National University, Korea — In this talk we consider the coalescence of microscopic flexible beams caused by the surface tension of an intervening liquid. Our work is motivated by the coalescence observed in the manufacture of MEMS devices. We develop a model coupling the elastic deflection of the beams, lubrication-type flow and surface tension; we also investigate the role played by the evaporation of the liquid. In the absence of evaporation, multiple equilibrium states exist. We characterize these states and determine their stability. We consider the effect of evaporation and show that sufficiently high evaporation rates can suppress the tendency of beams to stick together. Finally, we consider some extensions of our models showing how the interaction between multiple beams may delay the rate of evolution and discuss the way in which heating the beams is even more effective in suppressing sticking.

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Date submitted: 01 Aug 2012

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