Abstract Submitted for the DFD07 Meeting of The American Physical Society

Physics of elastocapillary rise HO-YOUNG KIM, WONJIN AHN, Seoul National University, L. MAHADEVAN, Harvard University — When a paintbrush is dipped into a pot of paint and pulled out, surface tension forces cause the individual hairs in the brush to coalesce even as the brush becomes impregnated with paint. We study both the statics and dynamics of this elastocapillary interaction in the context of the surface-tension-driven vertical rise of a liquid between two long flexible hydrophilic sheets that are held a small distance apart at one end. We provide an analytic theory for the static shapes of the sheets as well as the liquid rise height which is different from that of the classical law of Jurin. Also we numerically solve the time evolutions of the sheet shapes and the liquid height, obtaining different solutions from that of Washburn. We compare the theoretical results with the experiments to find good agreements between them.

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Date submitted: 03 Aug 2007

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