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Sudden Thickening in Flowing Soap Films<sup>1</sup> WALTER GOLDBURG, STANLEY STEERS, NIKOLAUS HARTMAN, University of Pittsburgh — There is no difficulty in creating soap films that flow vertically downward under gravity at speeds of the order of a m/s. If the height of the film  $L_0$  is of the order of 1 m or less, the film thickness h(x) is a few microns (The coordinate x increases downward below the injection point at x = 0.) However if  $L_0$  is of the order of 2 m, one finds that h abruptly increases at a sharply defined value of x = L. In the experiments to be described,  $L \simeq = .9$  m. As expected, the vertical film velocity  $v_x(x)$  correspondingly drops to a small fraction of its upstream value at  $x \simeq L$ . In the narrow transition region from thin to thick film at x = L, both h(x) and the  $v_x(x)$  oscillate at a well-defined frequency of the order of 1 Hz. The abrupt thickening is expected on the basis of singular perturbation theory (T. Tran, following paper).

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