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Broad hump or sharp cusp: two-layer withdrawal with unequal viscosities WENDY ZHANG, University of Chicago , FRANCOIS BLANCHETTE, University of California Merced — In viscous two-layer withdrawal, the interface between two layers of liquid is deformed into a hump shape by a spatially converging withdrawal flow in the upper layer. Previous work found that, when the two layers have the same viscosity, increasing the withdrawal flux changes the shape of the steady-state interface in an unusual way: the hump curvature, κ , increases dramatically but the hump height increases only weakly, proportional to $\ln(\kappa)$. Here we show that this unusual weak coupling persists even when the lower layer is made more viscous than the upper layer. However, when the lower layer is less viscous than the upper layer, the coupling between the hump height and the hump curvature is modified from the logarithmic form.

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