Supplementary Information for

Rheology dictated spreading regimes of a non-isothermal sessile drop

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S-1. Validation of the numerical method

In this section, we compare the drop profiles from the presently adopted numerical scheme and those of others for different values of the equilibrium contact angle and multiple times instants.

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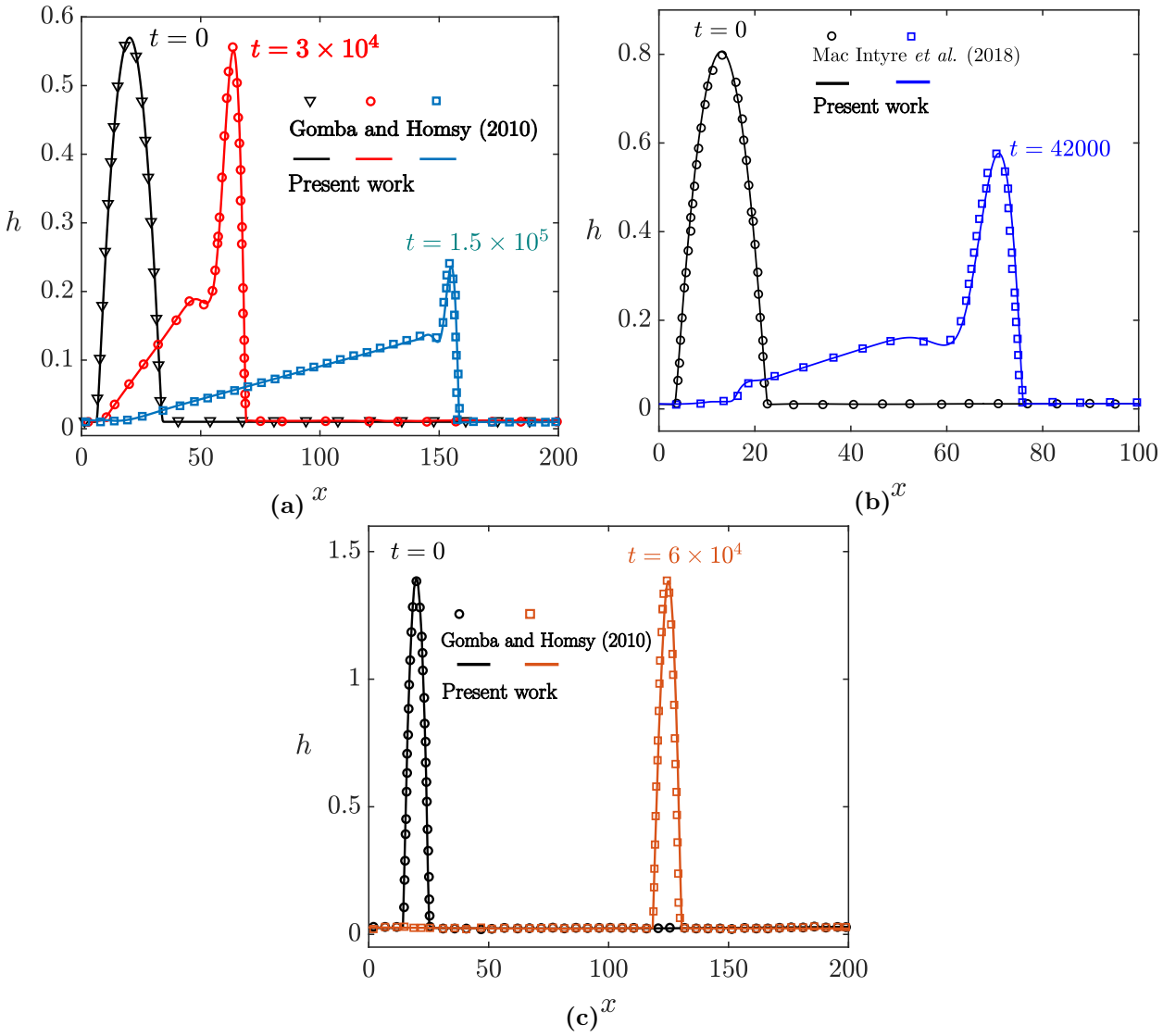

Figure S-1: Comparison between the droplet profiles obtained from present numerical simulations and data from literature related to Newtonian drops (Gomba & Homsy, 2010; Mac Intyre *et al.*, 2018). Three difference equilibrium contact angles, $\theta_e = 5^0, 10^0$ and 30^0 have been used in subplots (a),(b), and (c), respectively. In each case, $\beta = 0.007$ has been chosen. Solid lines and markers denote the present simulations and earlier results, respectively.

S-2. Sample droplet profiles for new transition regimes

Here, we show the examples of dynamic droplet evolution profiles that are newly triggered by the non-Newtonian fluid properties.

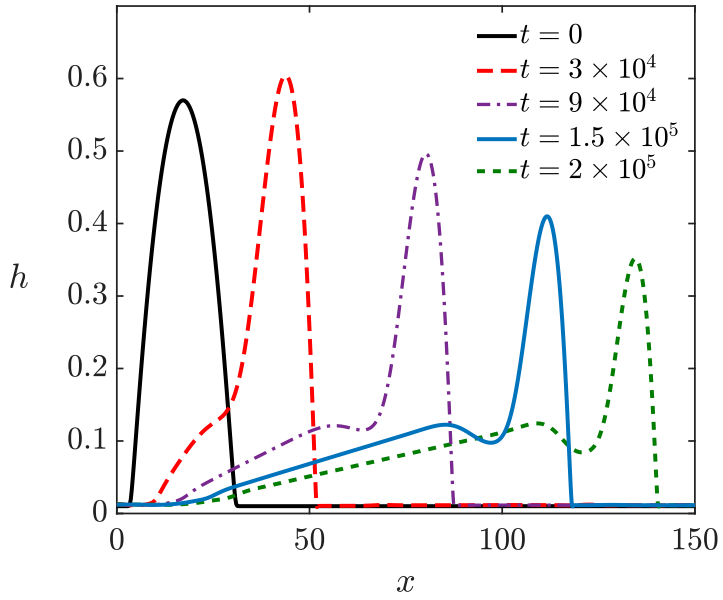

Figure S-2: Time evolution of Marangoni films for $\theta_e = 5^0, \beta = 0.001, n = 1.4$

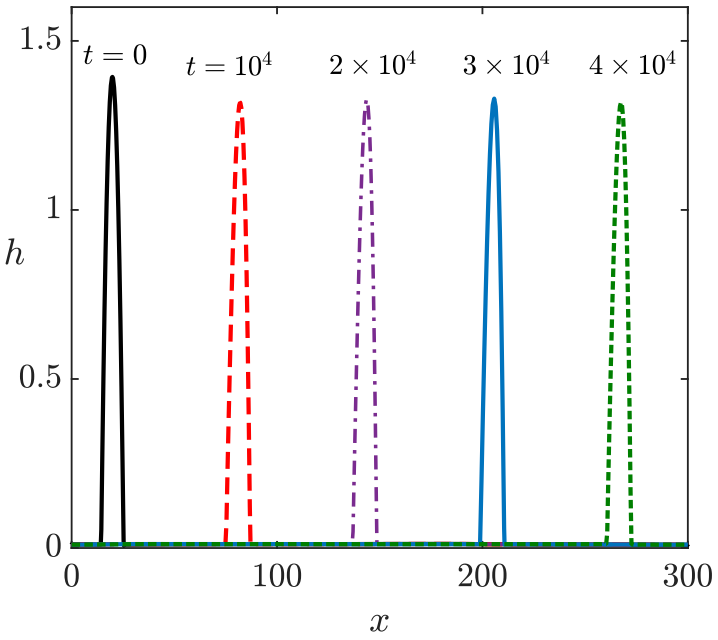

Figure S-3: Time evolution of the uniform droplet profiles for $\theta_e = 30^0, \beta = 0.03$, and $n = 0.6$.

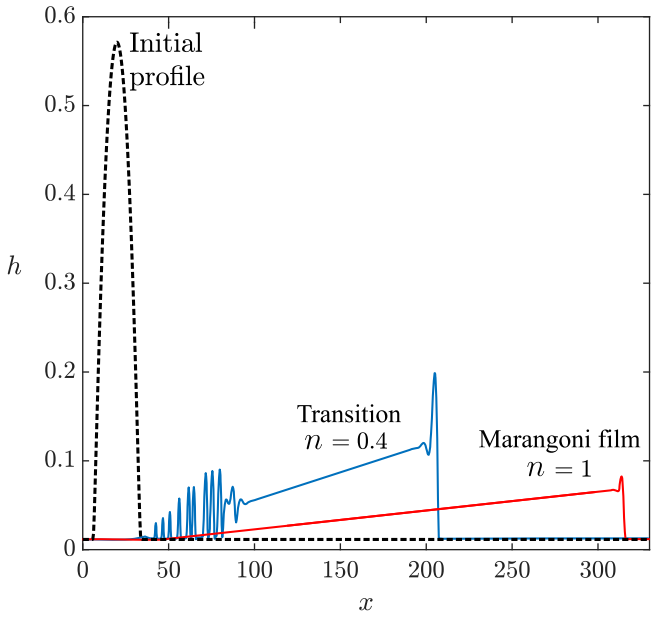

Figure S-4: Comparison of droplet profiles for different power-law indices n at a fixed time $t = 10^5$. Other parameters are $\theta_e = 10^0, \mathcal{A} = 10$ and $\beta = 0.03$.

References

Gomba, Juan M & Homsy, George M 2010 Regimes of thermocapillary migration of droplets under partial wetting conditions. *Journal of Fluid Mechanics* **647**, 125–142.

Mac Intyre, Jonatan Raúl, Gomba, Juan Manuel, Perazzo, Carlos Alberto, Correa, Pablo Germán & Sellier, M 2018 Thermocapillary migration of droplets under molecular and gravitational forces. *Journal of Fluid Mechanics* **847**, 1–27.