Supplementary Materials: On Waviness and Two-Sided Surface Features in Thermal Elastohydrodynamically Lubricated Line Contacts

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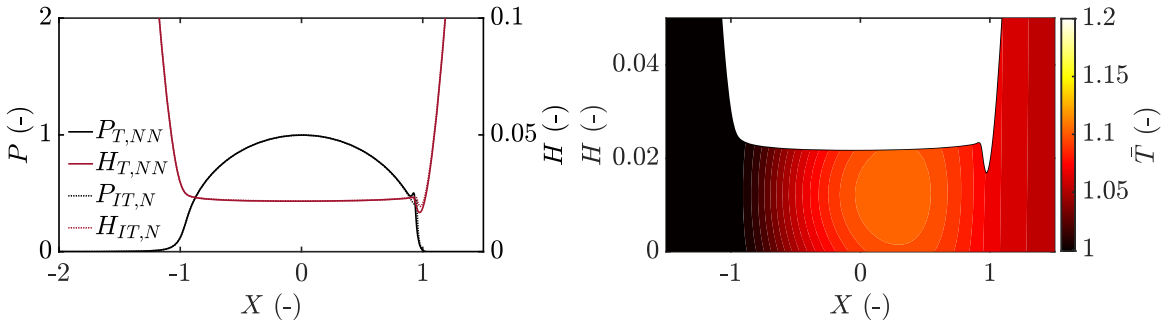

Figure S1. Pressure and film thickness (**left column**), and temperature throughout the film (**right column**) for the smooth contact case. A difference of approximately 15% between the thermal non-Newtonian solution and the isothermal Newtonian solution is seen in the outlet of the contact due to inlet shear heating and shear thinning, which further leads to an increased pressure driven flow in the contact outlet.

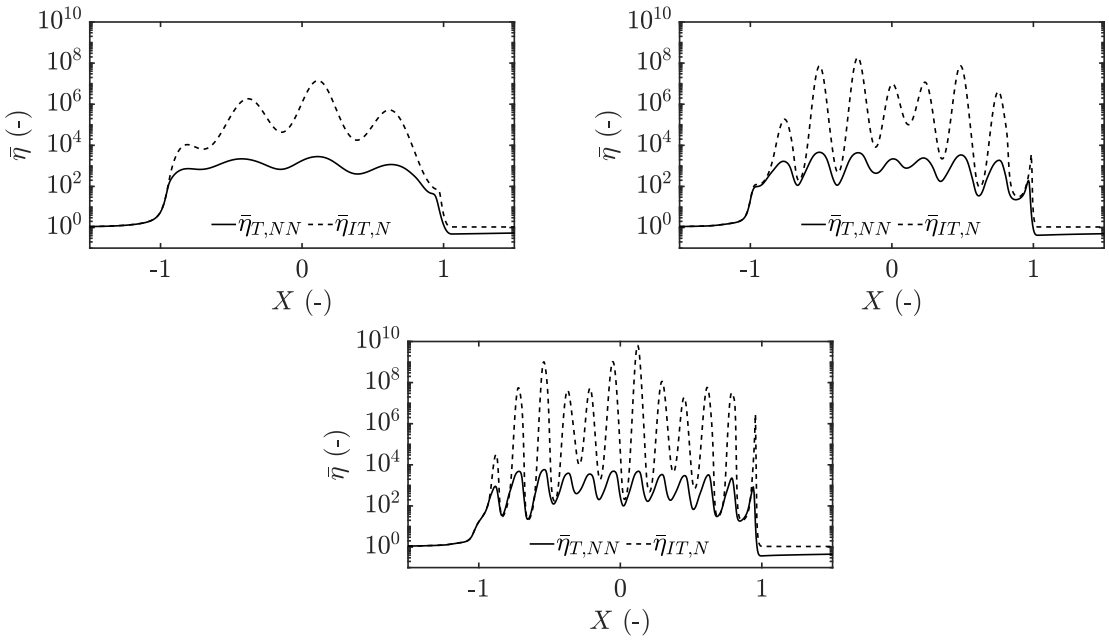

Figure S2. Comparison of viscosity for the thermal non-Newtonian (T,NN) at $z = h/2$ and the isothermal Newtonian (IT,N) at $\Theta = 2.5$. The figure shows the difference for the cases $\Lambda_{\mathcal{R},1} = 1/2$ (**top left**), $\Lambda_{\mathcal{R},1} = 1/4$ (**top right**) and $\Lambda_{\mathcal{R},1} = 1/6$ (**bottom**)

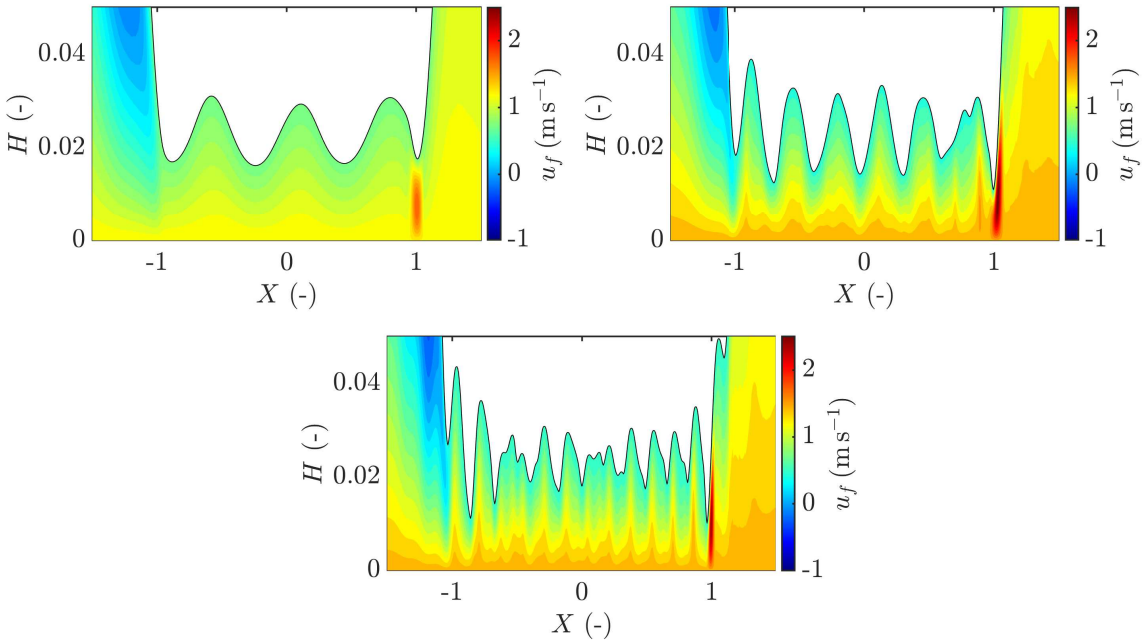

Figure S3. Lubricant velocity field throughout the film thickness at $\Theta = 2.5$ for the cases $\Lambda_{\mathcal{R},1} = 1/2$ (**top left**), $\Lambda_{\mathcal{R},1} = 1/4$ (**top right**) and $\Lambda_{\mathcal{R},1} = 1/6$ (**bottom**).

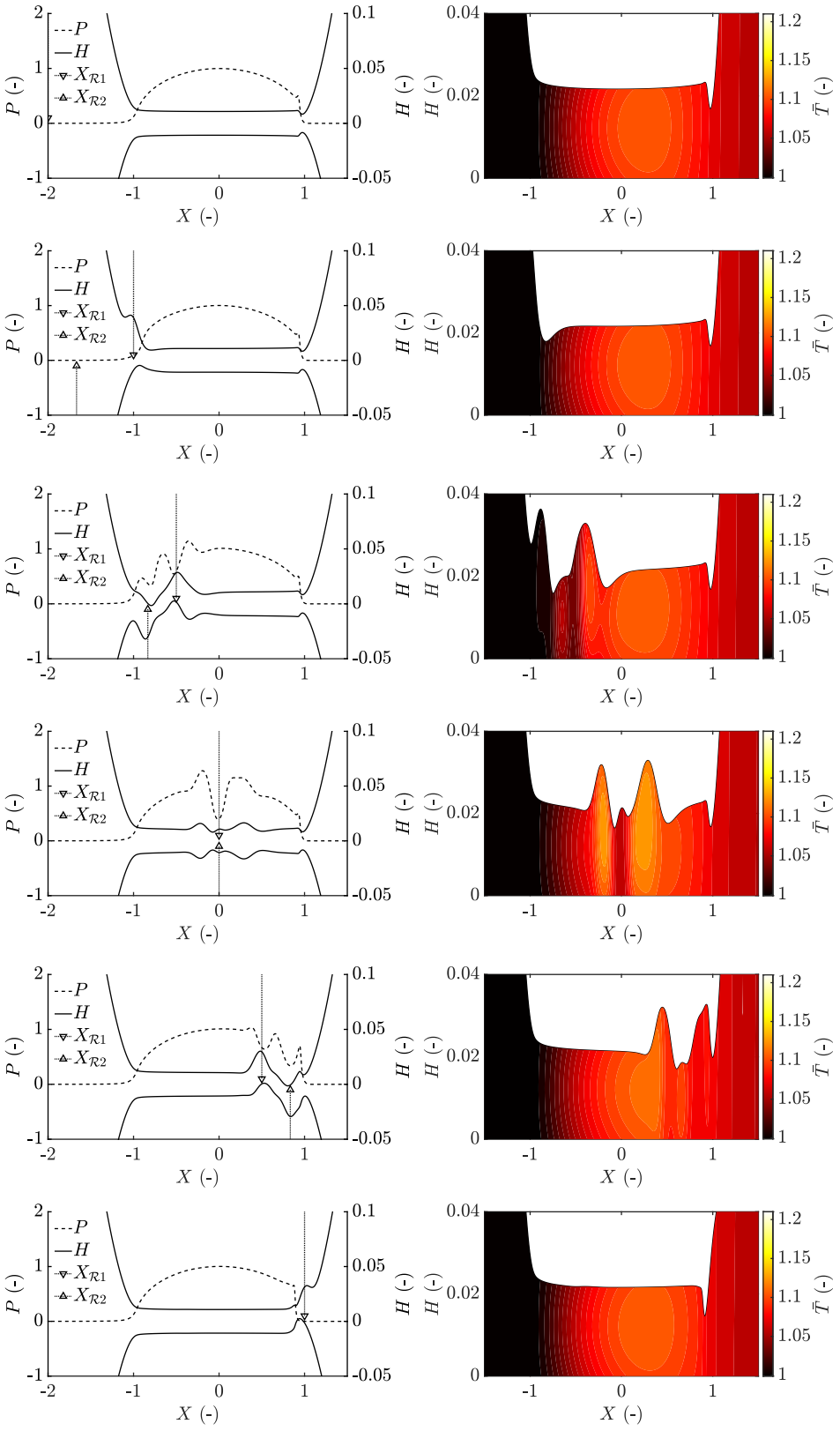

Figure S4. Pressure and film thickness (**left column**), and temperature throughout the film (**right column**) for the case $D + D$ showing the transient solution frozen in time for the positions $X_{\mathcal{R},1} = -2$, $X_{\mathcal{R},1} = -1$, $X_{\mathcal{R},1} = -0.5$, $X_{\mathcal{R},1} = -0$, $X_{\mathcal{R},1} = 0.5$ and $X_{\mathcal{R},1} = 1$ from top to bottom.

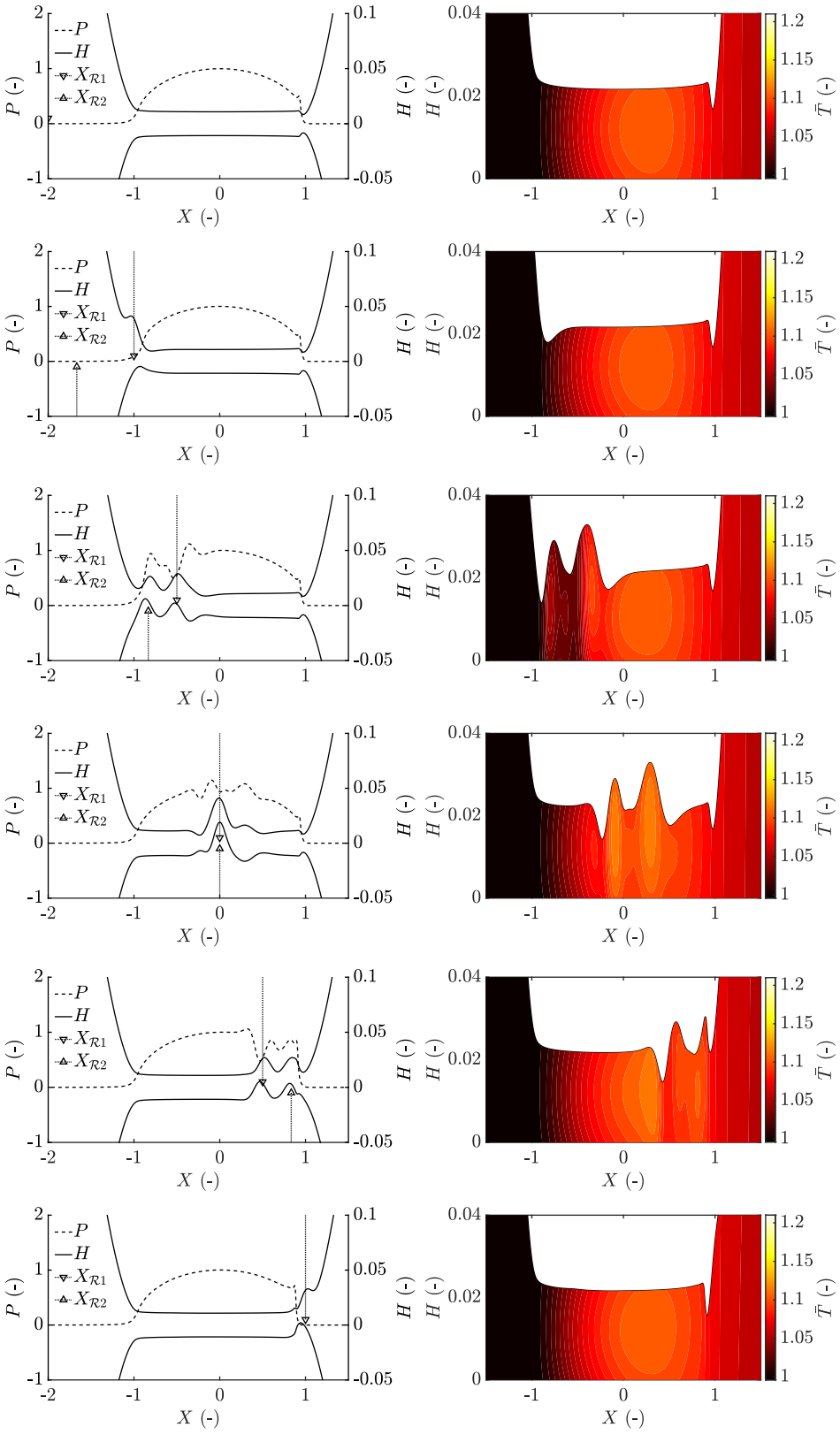

Figure S5. Pressure and film thickness (**left column**), and temperature throughout the film (**right column**) for the case $D + A$ showing the transient solution frozen in time for the positions $X_{\mathcal{R},1} = -2$, $X_{\mathcal{R},1} = -1$, $X_{\mathcal{R},1} = -0.5$, $X_{\mathcal{R},1} = -0$, $X_{\mathcal{R},1} = 0.5$ and $X_{\mathcal{R},1} = 1$ from top to bottom.

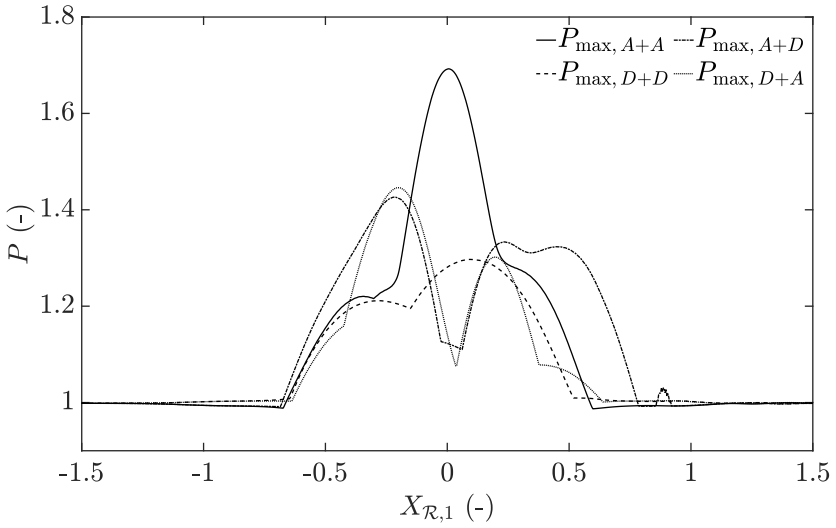

Figure S6. Maximum pressure over time for the four studied overtaking scenarios using the thermal non-Newtonian approach, following the position of the surface feature located on the upper surface, i.e. $X_{\mathcal{R},1}$.

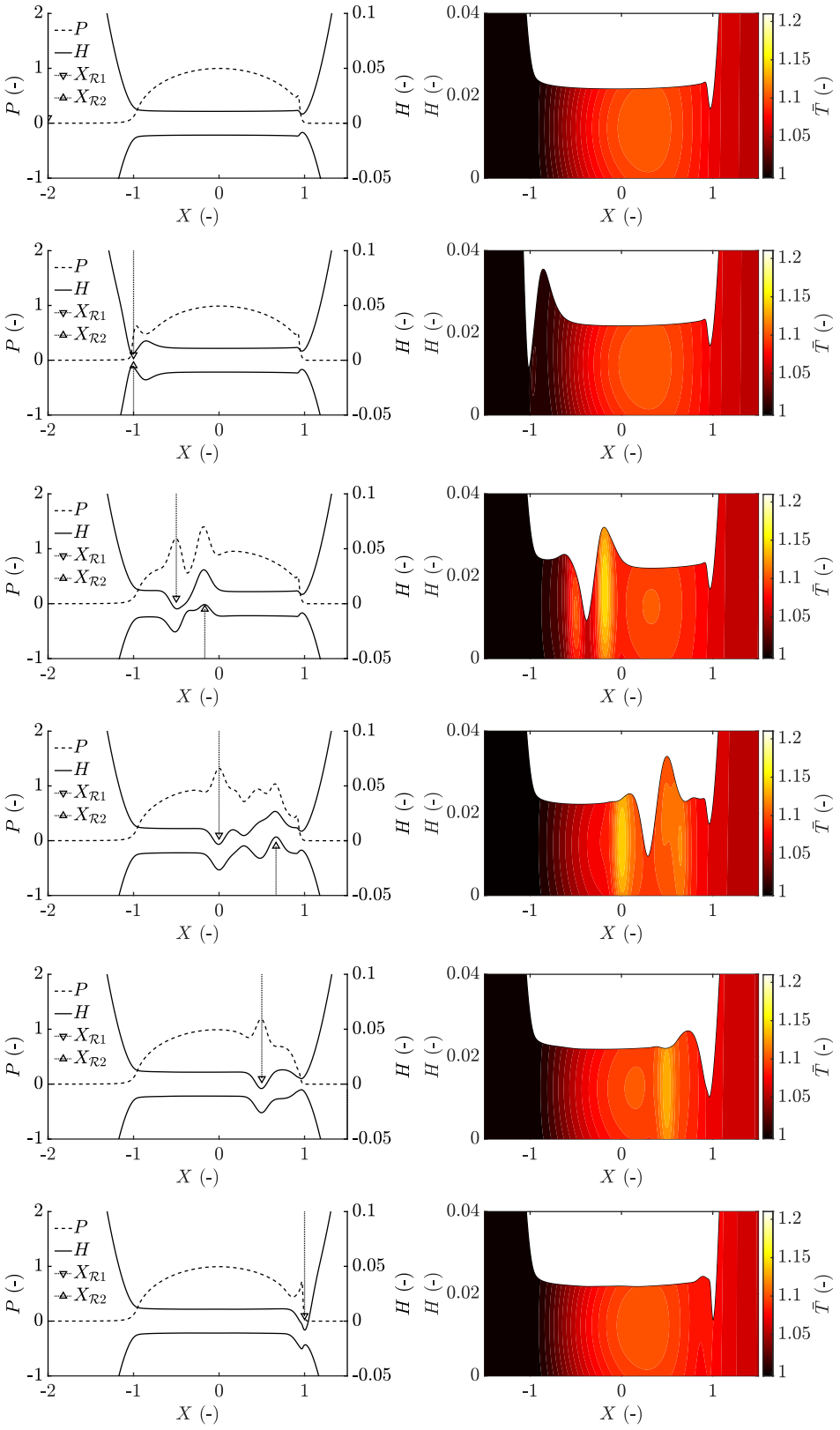

Figure S7. Pressure and film thickness (**left column**), and temperature throughout the film (**right column**) for the case $A + A$ with overtaking at the inlet, i.e. at $X = -1$, showing the transient solution frozen in time for the positions $X_{\mathcal{R},1} = -2$, $X_{\mathcal{R},1} = -1$, $X_{\mathcal{R},1} = -0.5$, $X_{\mathcal{R},1} = -0$, $X_{\mathcal{R},1} = 0.5$ and $X_{\mathcal{R},1} = 1$ from top to bottom.