Supporting Information

Modeling elastoviscoplastic materials using physics-informed neural networks

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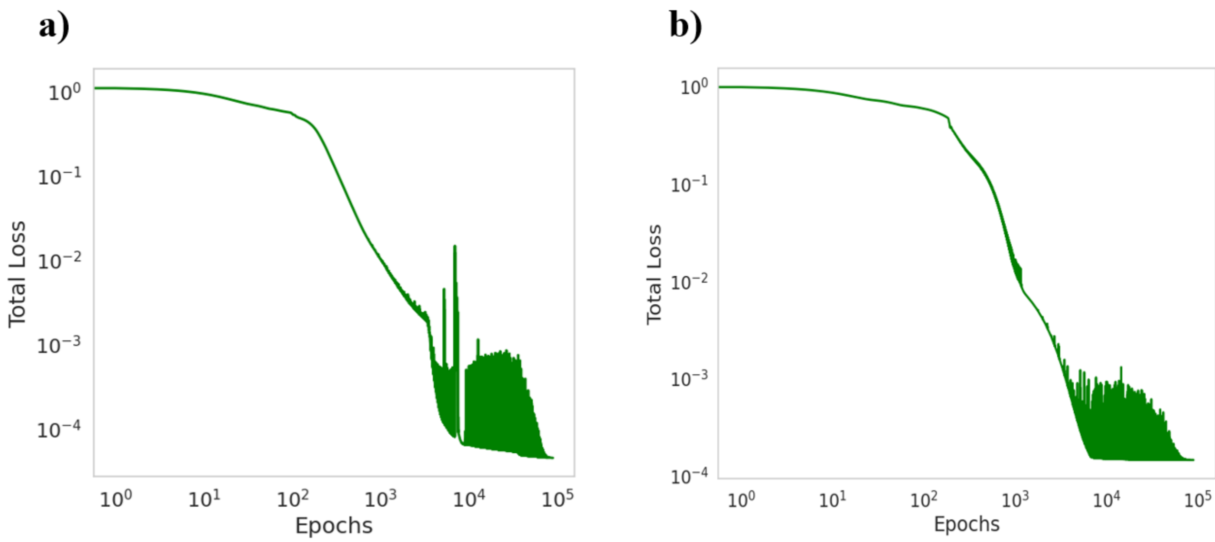

Fig. S1. a) loss optimization of the PINN fitting with respect to epochs for synthetic stress data example with following parameters: a) λ= 0.05 s, τ_0=75 Pa, η_p= 20 Pa.s, and η= 10 Pa.s, and b) λ= 0.1 s, τ_0=25 Pa, η_p= 10 Pa.s, and η= 20 Pa.s

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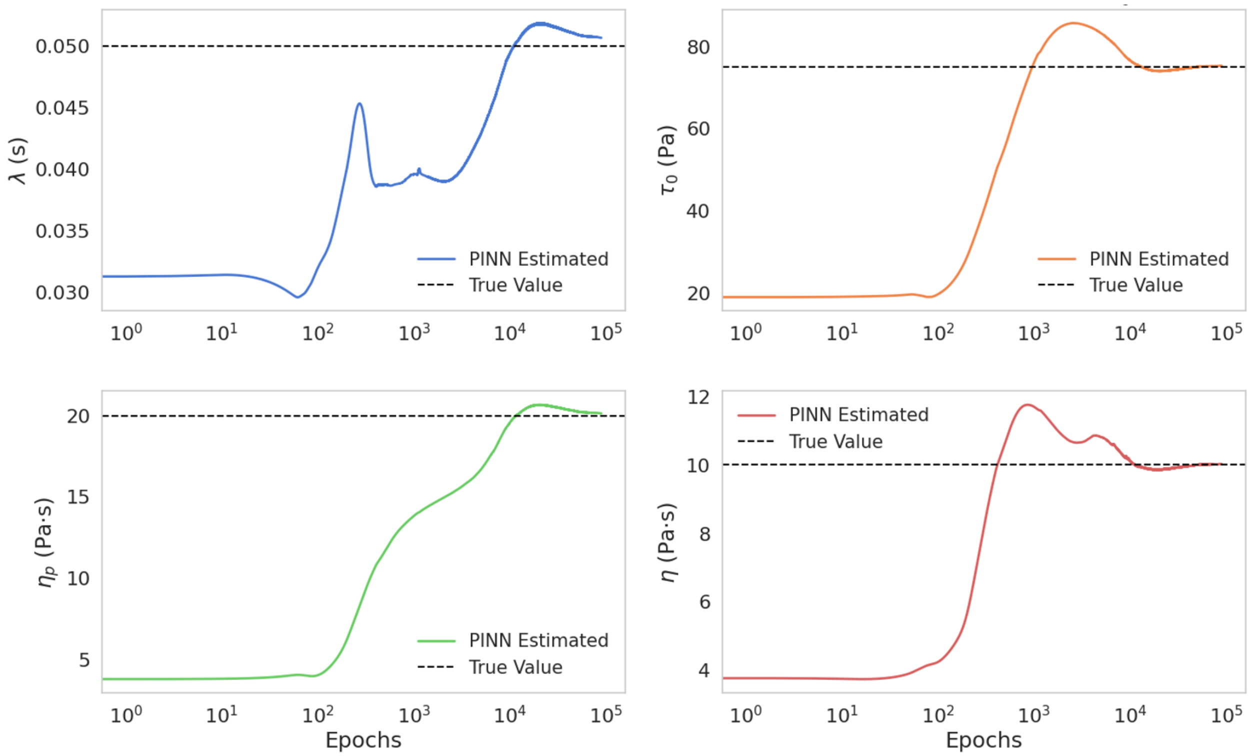

Fig. S2. Evolution of fitting parameters of the Saramito model with respect to epochs in comparison to the original constant values of the example model for synthetic data based on λ= 0.05 s, τ_0=75 Pa, η_p= 20 Pa.s, and η= 10 Pa.s

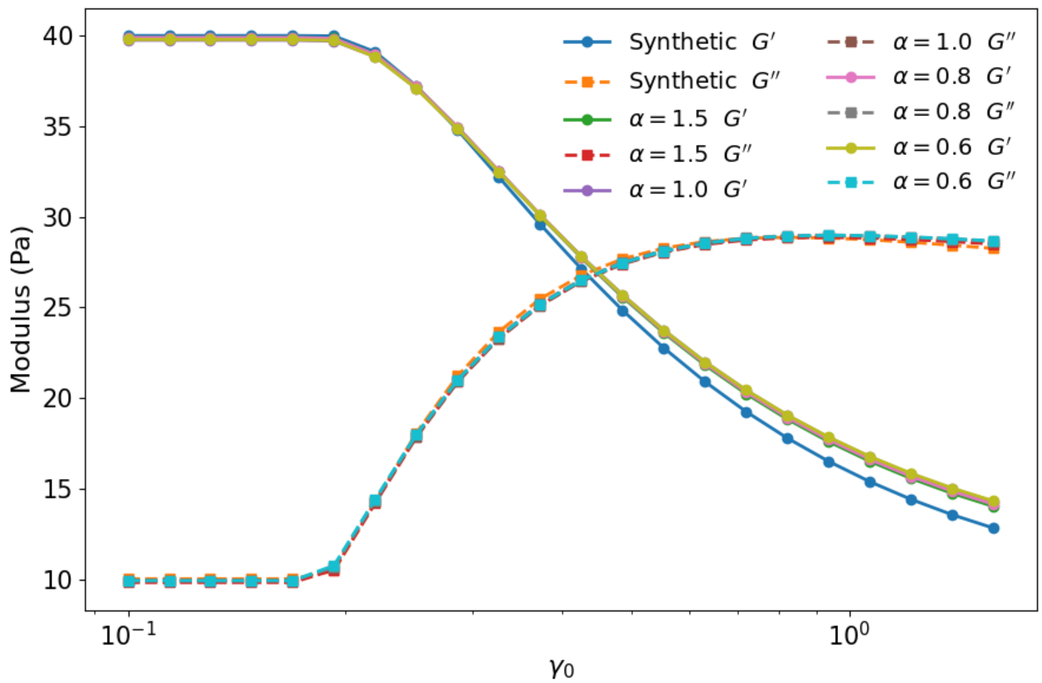

Fig. S3. Comparison of the loss and elastic moduli of the synthetic data generated from λ= 0.05 s, τ_0=75 Pa, η_p= 20 Pa.s, and η= 10 Pa.s, and the fitted model based on various values of α

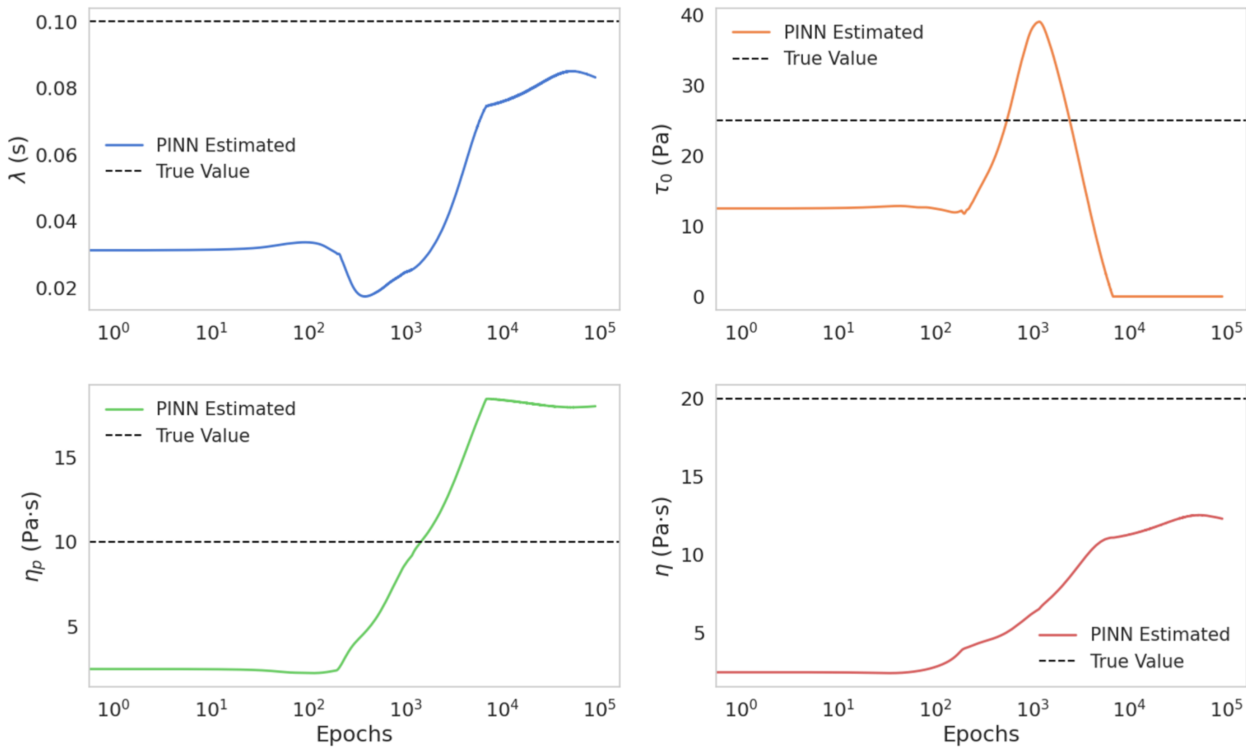

Fig. S4. Evolution of fitting parameters of the Saramito model with respect to epochs in comparison to the original constant values of the example model for synthetic data with λ= 0.1 s, τ_0=25 Pa, η_p= 10 Pa.s, and η= 20 Pa.s

Table S1. Fitted parameters of the classic Saramito model to the nanoemulsion sample at 10 rad/s and the strain amplitude of 0.5, regarding different fitting methods

Method	λ (s)	η_p (Pa·s)	τ_0 (Pa)	η (Pa·s)	G (Pa)	MSE
PINN	0.0097	35.13	167.35	26.69	3612.06	3.082×10^{-2}
Gradient descent	diverge	diverge	diverge	diverge	diverge	-
Levenberg-Marquardt	0.0051	11.91	inf	45.83	233.53	6.938×10^{-2}
Nelder-Mead	diverge	diverge	diverge	diverge	diverge	-