Supporting Information for

Scientific Machine Learning for Complex Fluid Modeling

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- Supporting text
- Fig. S1
Hydrogel Linear Rheology. A small amplitude oscillatory shear frequency sweep was performed on the DHR-3 rheometer (8mm parallel plate, 25°C) to characterize the linear mechanical response of the hydrogel system. The experiment was conducted in stress control with a fixed amplitude of $\sigma_0 = 5$ Pa, with frequencies ranging from 100 rad/s to 1 rad/s (five frequencies per decade). The storage and loss moduli computed from these experiments are presented as circles in Figure S1. The linear response was fit to a single linear Maxwell mode:

$$G^*(\omega) = \frac{G_0(i\omega\tau_1)}{1 + i\omega\tau_1},$$

[1]

by least squares regression, from which the optimal values of $G_0 = 37585$ Pa and $\tau_1 = 0.557$ s were obtained. The resulting best fit to the data are shown by the dashed lines in Figure S1.
Fig. S1. The linear mechanical response of the metal-crosslinked polymer hydrogel system. The measured storage ($G'(\omega)$) and loss ($G''(\omega)$) moduli are shown by red and blue symbols, respectively. The corresponding best-fit predictions of the single-mode Maxwell model ($G_0 = 37585 \text{ Pa}$ and $\tau_1 = 0.557 \text{ s}$) are shown by dashed lines.