Transient Response of Nonlinear Polymer Networks: a Kinetic Theory

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Highlights

- A model is derived for the combined nonlinear elastic and transient response of polymers.
- A Boltzmann-type equation describe the time evolution of a transient polymer network.
- Statistical mechanics provides a link between chain/cross-link mechanics and polymer response.
- A mean-field approximation yields a reduced model for polymer viscoelasticity under finite deformation.