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Exponential stability of a viscoelastic shear beam

Communication Info

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- (2) Viscoelastic
- (3) Faedo-Galerkin method
- (4) Stability exponential
- (5) Numerical result

Abstract

This work investigates a viscoelastic shear beam model under various boundary conditions. We prove the existence and uniqueness of solutions using the Faedo-Galerkin method and establish exponential stability through a Lyapunov functional. A numerical framework is developed using finite element discretization in space and a semi-implicit Euler scheme in time. We demonstrate that the discrete energy decays exponentially and derive a priori error estimates ensuring linear convergence. Numerical simulations are provided to support the theoretical findings.

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