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ON THE EXTENSIBLE VISCOELASTIC BEAM

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Abstract. This work is focused on the equation

$$\partial_{tt}u + \partial_{xxxx}u + \int_0^\infty \mu(s)\partial_{xxxx}[u(t) - u(t-s)]ds - \big(\beta + \|\partial_x u\|^2_{L^2(0,1)}\big)\partial_{xx}u = f$$

describing the motion of an extensible viscoelastic beam. Under suitable boundary conditions, the related dynamical system in the history space framework is shown to possess a global attractor of optimal regularity. The result is obtained by exploiting an appropriate decomposition of the solution semigroup, together with the existence of a Lyapunov functional.

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