Linear theory of nonisothermal forced elongation

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In this work the linearized equations of nonisothermal forced elongation are analyzed. It is shown that solutions for the associated boundary-initial value problem are governed by a strongly continuous semigroup of bounded linear operators on the physically correct state space and that the semigroup is eventually differentiable. The regularity of the semigroup is proven via two complementing methods. Whilst the first method is based on Pazy's classical result on eventual differentiability, the second method provides a direct argument. The regularity properties of the semigroup correspond to the expected physical behavior of the elongational flow.