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Decay of solutions for a mixture of thermoelastic solids

Abstract

We prove for the system modelling a mixture of n thermoelastic materials with different temperatures that strong stability implies exponential stability. That is, we show that the semigroup is exponentially stable if and only if the imaginary axis is contained in the resolvent set of the infinitesimal generator. In particular this implies the lack of polynomial stability to the corresponding semigroup.

$$\begin{aligned}
\mathbf{R}_1 U_{tt} - \mathbf{A} U_{xx} + \mathbf{B} \Upsilon_x &= 0 \\
\mathbf{R}_2 \Upsilon_t - \mathbf{K} \Upsilon_{xx} + \mathbf{B}^\top U_{tx} + a\mathbf{N}\Upsilon &= 0
\end{aligned} \tag{1}$$

Keywords: exponential stability, C_0-semigroups, mixture of thermoelastic solids.

References

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