

On exponential stability for thermoelastic plates – a
comparison of different models*

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Abstract

We consider different models of thermoelastic plates in a bounded reference configuration: with Fourier heat conduction or with the Cattaneo model, and with or without inertial terms. Some models exhibit exponential stability, others are not exponential stable. In the cases of exponential stability, we give an explicit estimate for the rate of decay in terms of the essential parameters appearing (delay $\tau \geq 0$, inertial constant $\mu \geq 0$), using multiplier methods. The singular limits $\tau \downarrow 0$, and, in particular, $\mu \downarrow 0$ are also investigated in order to understand the mutual relevance for the (non-) exponential stability of the models. Numerical simulations underline the analytic estimates.

References

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