Global-in-time regular unique solutions to the 1d thermoelasticity and time-asymptotic

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In the talk, we shall say about the construction of unique regular solutions to the minimal nonlinear system of the 1d thermoelasticity. The obtained solution has a positive temperature. Our approach is based on an estimate using the Fisher information, which seems completely new in this context. It is combined with a recent temperature inequality and embedding inequality, which allows us to obtain a new energy estimate. The latter is used in a half-Galerkin procedure to yield global solutions. The uniqueness and further regularity of such solutions are obtained.

Moreover, we present the result concerning the time-asymptotic of solutions. Namely, it will be shown that the displacement converges to 0, and the temperature converges to a constant function.