On the minimal nonlinear thermoelasticity model.

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Abstract:
I'm going to review recent results concerning global existence and uniqueness of solutions to the minimal nonlinear model of thermoelasticity. The model has a long studies history, I'm going to review it (together with a physical derivation) in the first part of my talk. Next, I'm going to formulate the main results concerning time-global existence and uniqueness of solutions in 1d and 3d cases. Both questions were so far fully open. Our results (1d with Piotr Bies, 3d with Boris Muha and Srdan Trifunovic) are based on two new energy estimates, one yielding the result in 3d, another yielding the1d result. Moreover, 1d result makes strong use of a recent functional inequality introduced recently at a different occasion by myself and co-authors. We obtain regular unique solutions with a positive temperature in 1d as well as weak solutions with a defect measure in a 3d case.The latter is weak-strong unique. Moreover it introduces a temperature which is a measure with a positive regular part.