Minimal state in viscoelasticity and applications to PDEs

Mauro Fabrizio
University of Bologna
E-mail: fabrizio@dm.unibo.it

We show the impact on the initial-boundary value problem of the use of a new notion of state based on the stress-response. Comparisons are made between this new approach and the traditional one, which is based on the identification of histories as states. We shall refer to a stress-response definition of state as the minimal state. Material with memory and with elastic relaxation are discussed. Finally, we show how the evolution of a linear viscoelastic system can be described through a strongly continuous semigroup of linear contraction operators on a appropriate Hilbert space. The family of all solutions of the evolutionary system, obtained by varying the initial data in such a space, is shown to have exponentially decaying energy.