Exponential decay in one-dimensional type II/III thermoelasticity with double voids

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1 Abstract

In this communication we study the one-dimensional version of the Green-Naghdi type II thermoelasticity with two porous structures. A system of four hyperbolic and conservative equations arises. For this system we can consider several structural dissipative mechanisms as, for instance, the viscosity, the porous-dissipation or the thermal dissipation (in this last case we are, in fact, analysing the Green-Naghdi type III model). It is clear that this model in stable, but not asymptotically stable. Our challenge is to be able to introduce togheter in the system two of these dissipative mechanisms in the system in such a way that we can obtain an exponentially stable system. We will see that if the porous dissipation is added jointly with any other damping mechanism, therefore the exponential stability is obtained in the generic situation.

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