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A Mathematical Analysis of a Model for Phase Transitions in Thermoviscoelastic Isochoric Materials

José Luiz Boldrini *

We analyze a highly nonlinear system of partial differential equations that may be used to model the solidification and melting of thermoviscoelastic isochoric materials with the possibility of motton of the material during the process.

This system consists of an internal energy balance equation, governing the evolution of temperature, coupled with an evolution equation for the phase field, whose values determine the state of material, and a moment balance equation governing the material displacement. For this model, under suitable dissipation, we prove existence and uniqueness of solutions.

*Univesidade Estadual de Campinas, Brasil email: boldrini@ime.unicamp.br