

Pressure-relaxation limit for a one-velocity Baer-Nunziato model to a Kapila model

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In this talk, we show that the solutions of the Kapila system, generated by initial data close to equilibrium, are obtained in the pressure-relaxation limit from solutions of a one-velocity Baer-Nunziato (BN) model. Besides the fact that the quasilinear part of (BN) cannot be written in conservative form, its natural associated entropy is only positive semi-definite such that the entropic variables cannot be used to symmetrize it. Here, using an ad-hoc change of variable, we obtain a symmetric reformulation of (BN) which couples, via low-order terms, an undamped mode and a partially dissipative hyperbolic system satisfying the Shizuta-Kawashima stability condition. This leads to the global well-posedness of (BN) for small data. Moreover, the change of variable is adapted to the pressure-relaxation process, i.e., it isolates the component that vanishes in the limit and provides uniform bounds that allow us to prove a strong convergence result.

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