# An acoustic/transport splitting method for the isentropic Baer-Nunziato two-phase flow model

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We are interested in the computation of compressible two-phase flows with the isentropic Baer-Nunziato two-phase flow model [1, 4] by using a finite volume methods that decouples acoustic and transport phenomena. This approach is well-suited to many industrial applications like the simulation of flows in nuclear reactors when the material velocities are low compared to the sound velocities. For the Euler system, the classic Lagrange-Projection method allows to perform such decoupling by solving the flow equations in Lagrangian coordinates. Unfortunately, the Baer-Nunziato model involves three different material waves that do not allow to exhibit a simple expression of the system using Lagrangian coordinates. Using similar ideas as in [2, 4], we consider an operator splitting strategy that allows to separate an acoustic subsystem and a transport subsystem for the Baer-Nunziato model. This operator splitting allows to design a numerical scheme with a time-implicit treatment of the (fast) acoustic waves, in order to get rid of a too restrictive CFL condition, and an explicit treatment of the (slow) material waves in order to preserve accuracy, for the isentropic Baer-Nunziato model.

## References

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