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Derivation of models and numerical methods for homogenized multiphase flows based on stochastic ideas

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This talk is dedicated to the derivation of models and numerical methods for compressible multiphase flows, more precisely on Baer-and-Nunziato type models[1, 5].

Such models are *averaged* models, able to both model interface flows and well mixed flows. They can be obtained by averaging Euler models following ideas developed in [2]. A new averaging method was developed in [3], based on an explicit stochastic model. We will show that the multiscale model obtained contains several known models in some limits (e.g. nonconservative and relaxation terms of [5, 3]), and also that it ensures in general all phasic entropy inequalities. Last, we will also show that the same method can be applied at the discrete level for deriving a numerical scheme that ensures also positivity and all the entropy inequalities under CFL conditions that can be explicitly derived.

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