solutions defined globally in time, one has to switch to the notion of weak solutions. This approach is based on the idea of including some form of the energy/entropy balance as an integral part of a weak formulation, and goes back to Dafermos (1979) concerning conservation laws and to Germain (2011) who introduced a similar concept in the context of the deterministic compressible Navier–Stokes system. Therefore, the solutions constructed in this part of the book are the so-called dissipative martingale solutions, which are weak martingale solutions also satisfying a variant of the energy balance.

Finally, Part III of the book is focused on applications such as singular limits. Indeed, by scaling the equations by means of appropriately chosen reference units, the parameters determining the behaviour of the system become evident. Asymptotic analysis and/or singular limits provide a useful tool in situations where these parameters vanish or become infinite. In this part, the authors describe a rigorous mathematical approach to asymptotic analysis in the case of incompressible and inviscid–incompressible limits for the compressible Navier–Stokes system with stochastic perturbations.

To conclude, this is the first book in which one can find a complete description of the available theory on compressible stochastic fluid equations. Compared to the previous literature, this is a new point of view that makes the book original and of very high quality. It is a really valuable and much-needed contribution to the literature in the domain. This monograph is built in a masterly manner, in such a way as to provide not only a complete and up-to-date overview of the problems under consideration, but also a detailed introduction to the topic for the uninitiated reader. The book is very well and rigorously structured, having the excellent attribute of being valuable to both experienced researchers in the domain and to graduate students who wish to explore the different topics in this challenging area of research. Overall, it constitutes an ideal book for researchers (in the broadest sense) who want to enlarge their mathematical knowledge of fluid mechanics.

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New editor appointed

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