Advances in multiscale flow modelling: methods and applications

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Abstract

This mini-symposium is proposed as a discussion forum for the experts who develop and apply novel computational techniques in different fluid dynamics areas. Aeroacoustics, geophysical flows, and thermal fluctuations in fluids at nanoscale are to name but a few examples of topical applications. Some of the proposed discussion topics in this mini-symposium will be approaches for unsteady flow modelling that preserve accurate balances and resolve complex multiscale flow phenomena. This involves both high-resolution computational schemes and small-scale/large-scale coupling approaches (coupling turbulence and far-field sound for instance). Another interesting question is : what are the most important properties of numerical algorithms in multiscale schemes for preserving the underlying multi-scale physics, e.g., conservation, low dispersion and diffusion, preservation of a statistical variance or some important underlying equilibria ?