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Abstracts of Plenary and Invited Lectures

Section:

16. Applications

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Mathematics in Numerical Flow Simulation

The numerical computation of fluid and gas flow is a rich field asking for more mathematical analysis. The key issues today are "accuracy", "efficiency" and "reliability" in terms of quantitative error control and economic grid generation. New developments in these directions make it possible to run simulations routinely on workstations. Reaching this goal requires input from the theory of differential equations, multiscale techniques and optimization. The impact of these theoretical aspects on practical problems is exemplarily illustrated by the computation 1) of drag and lift forces of blunt bodies and 2) of concentration profiles in chemical flow reactors.