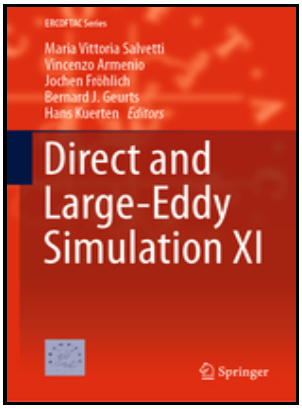
Numerical techniques for direct and large-eddy simulations

Taylor & Francis - [PDF] Direct Building Energy Simulation Based on Large Eddy Techniques and Lattice Boltzmann Methods



Description: -
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Fluid dynamics -- Mathematical models
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Chapman & Hall/CRC numerical analysis and scientific computingNumerical techniques for direct and large-eddy simulations
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Researchers examining the application of various types of synthetic and precursor calculations have found that the more realistic the inlet turbulence, the more accurate LES predicts results.

Toward exascale: Large eddy simulation and direct numerical simulation of nuclear reactor flows with the spectral element method — Penn State

These are based on an artificial eddy viscosity approach, where the effects of turbulence are lumped into a turbulent viscosity.

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Series Title: Responsibility: Xi Jiang, Choi-Hong Lai.

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This is mainly due to the impact of noise emission and existing laws defining limits for noise levels. They cover advances in computational techniques, SGS modeling, boundary conditions, post-processing and data analysis, and applications in several fields, namely multiphase and reactive flows, convection and heat transfer, compressible flows, aerodynamics of airfoils and wings, bluff-body and separated flows, internal flows and wall turbulence and other complex flows. AB - Numerical simulation has been an intrinsic part of nuclear engineering research supporting the design of nuclear power plants.

Numerical methods for Large Eddy Simulation

They fall into two groups: resolved sub-filter scales SFS , and sub-grid scales SGS. The turbulent flow over a forward facing step was considered as a test case for method development.

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Additionally, truncation error can also become an issue. These simulations can provide invaluable insight into the flow dynamics, which is difficult or often impossible to obtain with experiments alone.

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