



Unified Stochastic and Deterministic Turbulence Models

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Abstract:

The talk is organized in four parts. The first part describes requirements regarding the numerical simulation of turbulent flows. It will be shown that stochastic methods are needed which generalize deterministic methods such that the closure problems of deterministic equations are solved. The second part describes the basics of stochastic methods and their implied deterministic equations. The modeling of molecular dynamics, turbulent velocity and scalar fields will be discussed. Special emphasis is placed on the question of how existing (FDF and PDF, LES and RANS) methods can be unified. The third part describes the application of stochastic and deterministic methods to both non-reacting and reacting turbulent flow simulations. The integration of RANS and LES for swirling turbulent jet flow simulations will be discussed. It will be shown how the range of applicability of hybrid RANS/PDF methods can be extended such that nonpremixed turbulent combustion simulations can be performed. The fourth part summarizes these developments and describes future activities.

Foothills Laboratory 2 Room 1001

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(Refreshments at 10:30)