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Nota di contenuto	Modeling and Simulation of Turbulent Flows; Table of Contents; Foreword; Preface; Acknowledgements; Introduction; Chapter 1. Fundamentals in Statistical Modeling: Basic Physical Concepts; 1.1. The nature of turbulence; 1.2. The various approaches to turbulence; 1.3. Homogenous and isotropic turbulence (HIT); 1.4. Kolmogorov hypotheses and the local isotropy theory; 1.5. One point closures; 1.6. Functional description of turbulence; 1.7. Turbulent diffusion and Lagrangian description; 1.8. Two-dimensional turbulence; Chapter 2. Turbulence Transport Equations for an Incompressible Fluid 2.1. General transport equations2.2. Equations specific to the main types of turbulent flows; Chapter 3. Mathematical Tools; 3.1. Tensors; 3.2. Euclidian space in curvilinear coordinates, tensor fields; 3.3. Orthogonal curvilinear coordinates; 3.4. Conformal transformation; 3.5. Invariants; 3.6. Representation of tensorial functions; 3.7. Fourier transform in the fluctuating field; 3.8. Wavelet transform; Chapter 4.

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Sommario/riassunto

This title provides the fundamental bases for developing turbulence models on rational grounds. The main different methods of approach are considered, ranging from statistical modelling at various degrees of complexity to numerical simulations of turbulence. Each of these various methods has its own specific performances and limitations, which appear to be complementary rather than competitive. After a discussion of the basic concepts, mathematical tools and methods for closure, the book considers second order closure models. Emphasis is placed upon this approach because it embodies potentials