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Particles in the Near-Wall Region; 2.6.1 Near-Wall Region Including the Viscous Sublayer
2.6.2 The Equilibrium Logarithmic Layer2.6.3 High-Inertia Particles; 2.7 Motion of Particles in a Vertical Channel; 2.8 Deposition of Particles in a Vertical Channel; 3 Heat Exchange of Particles in Gradient Turbulent Flows; 3.1 The Kinetic Equation for the Joint PDF of Particle Velocity and Temperature; 3.2 The Equations for Single-Point Moments of Particle Temperature; 3.3 Algebraic Models of Turbulent Heat Fluxes; 3.3.1 Solution of the Kinetic Equation by the Chapman-Enskog Method; 3.3.2 Solving the Equation for Turbulent Heat Fluxes by the Iteration Method
3.4 Second Moments of Velocity and Temperature Fluctuations in a Homogeneous Shear Flow4 Collisions of Particles in a Turbulent Flow; 4.1 Collision Frequency of Monodispersed Particles in Isotropic Turbulence; 4.2 Collision Frequency in the Case of Combined Action of Turbulence and the Average Velocity Gradient; 4.3 Particle Collisions in an Anisotropic Turbulent Flow; 4.4 Boundary Conditions for the Disperse Phase with the Consideration of Particle Collisions; 4.5 The Effect of Particle Collisions on Turbulent Stresses in a Homogeneous Shear Flow
4.6 The Effect of Collisions on Particle Motion in a Vertical Channel5 Relative Dispersion and Clustering of Monodispersed Particles in Homogeneous Turbulence; 5.1 The Kinetic Equation for the Two-Point PDF of Relative Velocity of a Particle Pair; 5.2 Equations for Two-Point Moments of Relative Velocity of a Particle Pair; 5.3 Statistical Properties of Stationary Suspension of Particles in Isotropic Turbulence; 5.4 Influence of Clustering on Particle Collision Frequency; 5.5 Relative Dispersion of Two Particles in Isotropic Turbulence; 5.5.1 Dispersion of Inertialess Particles
5.5.2 Dispersion of Inertial Particles

Sommario/riassunto

The only work available to treat the theory of turbulent flow with suspended particles, this book also includes a section on simulation methods, comparing the model results obtained with the PDF method to those obtained with other techniques, such as DNS, LES and RANS. Written by experienced scientists with background in oil and gas processing, this book is applicable to a wide range of industries -- from the petrol industry and industrial chemistry to food and water processing.