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Instabilities; 2.9.1. Buoyant, Inertial, and Symmetric Instabilities; 2.9.2. Kelvin-Helmholtz Instability
2.9.3. Rayleigh-Benard Instability2.10. Representation of Eddy Fluxes; 2.10.1. K-Theory; 2.10.2. Higher Order Closure; 2.10.3. Large Eddy Simulation; 2.11. The Planetary Boundary Layer; 2.11.1. The Ekman Layer; 2.11.2. Boundary-Layer Stability; 2.11.3. The Surface Layer; Chapter 3: Cloud Microphysics; 3.1. Microphysics of Warm Clouds; 3.1.1. Nucleation of Drops; 3.1.2. Condensation and Evaporation; 3.1.3. Fallspeeds of Drops; 3.1.4. Continuous Collection; 3.1.5. Stochastic Collection; 3.1.6. Spontaneous and Collisional Breakup of Drops and Modification of the Stochastic Collection Formulation
3.2. Microphysics of Cold Clouds3.2.1. Homogeneous Nucleation of Ice Particles; 3.2.2. Heterogeneous Nucleation and Other Processes Forming Small Ice Particles in Clouds; 3.2.3. Vapor Deposition and Sublimation; 3.2.4. Aggregation and Riming; 3.2.5. Hail; 3.2.6. Ice Enhancement; 3.2.7. Fallspeeds of Ice Particles; 3.2.8. Melting; 3.3. Types of Microphysical Processes and Categories of Water Substance in Clouds; 3.4. Water-Continuity Equations; 3.5. Bin Water-Continuity Models; 3.5.1. General; 3.5.2. Bin Modeling of Warm Clouds; 3.5.3. Bin Modeling of Cold Clouds
3.6. Bulk Water-Continuity Models

Sommario/riassunto

As models of the Earth/atmosphere system and observations become ever more sophisticated, and concerns about climate change and societal impacts of extreme weather and its forecasting grow, understanding the role of clouds in the atmosphere is increasingly vital. Cloud Dynamics, Second Edition provides the essential information needed to understand how clouds affect climate and weather. This comprehensive book examines the underlying physics and dynamics of every specific type of cloud that occurs in the Earth's atmosphere, showing how clouds differ dynamically depending on whether they oc