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| | Soggetti | Cloud physics |
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| | Nota di bibliografia | Includes bibliographical references and index. |
| | Nota di contenuto | Cover; Contents; Preface; 1 Observation of clouds; 1.1 Water vapor in the atmosphere; 1.2 Where do clouds occur in the atmosphere?; 1.3 Conventional classifications of clouds; 1.3.1 High clouds (base height greater than 6000 m); 1.3.2 Middle clouds (base height between 2000 and 6000 m); 1.3.3 Low clouds (base height lower than 2000 m); 1.3.4 Clouds with vertical development; 1.4 Precipitation; 1.5 Observing clouds from an aircraft; 1.6 Cloud classification according to the phase of water substance; 1.7 Remote-sensing techniques of cloud observation; 1.7.1 Radar and lidar techniques |
| | | 1.7.2 Satellite techniquesProblem; 2 The shape and size of cloud and precipitation particles; 2.1 Clouds as a colloidal system; 2.2 Frequency of liquid water and ice clouds in subfreezing environment; 2.3 Types of particles in clouds and precipitation; 2.4 Sampling of cloud and precipitation particles; 2.5 Cloud droplet size distributions; 2.5.1 |

| Sommario/riassunto | This key new textbook provides a state-of-the-art view of the physics of cloud and precipitation formation, covering the most important topics in the field: the microphysics, thermodynamics and cloud-scale dynamics. Highlights include: the condensation process explained with new insights from chemical physics studies; the impact of the particle curvature (the Kelvin equation) and solute effect (the Kohler equation); homogeneous and heterogeneous nucleation from recent molecular dynamic simulations; and the hydrodynamics of falling hydrometeors and their impact on collision growth. 3D cloud-model simulations demonstrate the dynamics and microphysics of deep convective clouds and cirrus formation, and each chapter contains problems enabling students to review and implement their new learning. Packed with detailed mathematical derivations and cutting-edge stereographic illustrations, this is an ideal text for graduate and advanced undergraduate courses, and also serves as a reference for academic researchers and professionals working in atmospheric science, meteorology, climatology, remote sensing and environmental science. |