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in (Re-)analysis: Errors, Impacts, and the Ability to Exploit Current and Prospective Observations -- 12. Airborne Lidar Observations of Water Vapor Variability in Tropical Shallow Convective Environment -- 13. Emerging Technologies and Synergies for Airborne and Space-Based Measurements of Water Vapor Profiles -- 14. Observational Constraints on Cloud Feedbacks: The Role of Active Satellite Sensors -- 15. Shallow Circulations: Relevance and Strategies for Satellite Observation -- 16. EUREC4A: A Field Campaign to Elucidate the Couplings Between Clouds, Convection and Circulation.

Sommario/riassunto

This volume presents a series of overview articles arising from a workshop exploring the links among shallow clouds, water vapor, circulation, and climate sensitivity. It provides a state-of-the-art synthesis of understanding about the coupling of clouds and water vapor to the large-scale circulation. The emphasis is on two phenomena, namely the self-aggregation of deep convection and interactions between low clouds and the large-scale environment, with direct links to the sensitivity of climate to radiative perturbations. Each subject is approached using simulations, observations, and synthesizing theory; particular attention is paid to opportunities offered by new remote-sensing technologies, some still prospective. The collection provides a thorough grounding in topics representing one of the World Climate Research Program's Grand Challenges. Previously published in *Surveys in Geophysics*, Volume 38, Issue 6, 2017 The articles "Observing Convective Aggregation", "An Observational View of Relationships Between Moisture Aggregation, Cloud, and Radiative Heating Profiles", "Implications of Warm Rain in Shallow Cumulus and Congestus Clouds for Large-Scale Circulations", "A Survey of Precipitation-Induced Atmospheric Cold Pools over Oceans and Their Interactions with the Larger-Scale Environment", "Low-Cloud Feedbacks from Cloud-Controlling Factors: A Review", "Mechanisms and Model Diversity of Trade-Wind Shallow Cumulus Cloud Feedbacks: A Review", "Structure and Dynamical Influence of Water Vapor in the Lower Tropical Troposphere", "Emerging Technologies and Synergies for Airborne and Space-Based Measurements of Water Vapor Profiles", "Observational Constraints on Cloud Feedbacks: The Role of Active Satellite Sensors", and "EUREC4A: A Field Campaign to Elucidate the Couplings Between Clouds, Convection and Circulation" are available as open access articles under a CC BY 4.0 license at link.springer.com.
