

The Role of Cloud-Cloud Interactions in the organization shallow cumulus clouds

Friday, 7 May 2021 16:00 (1h 45m)

Some of the fundamental puzzles of climate research are related to limited understanding of the critical processes governing the organization and evolution of cloud fields. These processes include the understanding and representation of forcing of shallow convection and subsequent mixing processes. Here we tracked the Lagrangian evolution of thousands of individual shallow cumulus clouds in a large-eddy simulation for a period during the Holistic Interactions of Shallow Clouds, Aerosols, and Land-Ecosystems (HI-SCALE) field campaign in the U.S. Southern Great Plains. Results show that shallow clouds grow at the expense of the dissipation of neighboring clouds, which demonstrates the importance of the lateral interactions among clouds in the evolution of the cloud populations. Based on these interaction simple models of evolution of population of shallow clouds are derived for future parameterization applications.

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Session Classification: Organisation in Shallow Convection

Track Classification: Organisation in Shallow Convection