2018

Investigating the Influence of Cloud Size on Cumulus Cloud Entrainment

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MSL
ACADEMIC ENDEAVORS

Investigating the Influence of Cloud Size on Cumulus Cloud Entrainment

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Abstract

Clouds play a crucial role in determining the weather on local and global scales, yet their complexity accounts for some of the largest uncertainties in weather forecasts and climate models. Environmental air mixing or being drawn into a current, called entrainment, is one source to blame for this complexity. When air entrains into a cloud evaporation of in-cloud condensates increase and temperatures in the cloud drop, reducing buoyancy. The overall effect of entrainment inhibits a cloud's development, and usually results in the dissipation of a cloud. With the use of data generated from a high-resolution computer model known as Large Eddy Simulations, this project studies the entrainment in shallow convective cumulus clouds. Entrainment rates are estimated across a distribution of cloud sizes and heights, and the dependence of entrainment on these cloud characteristics is investigated.