



Developing Present-day Proxy Cases Based on NARVAL Data for Investigating Low Level Cloud Responses to Future Climate Change.

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The energy budget of the entire global climate is significantly influenced by the presence of boundary layer clouds. The main aim of the High Definition Clouds and Precipitation for Advancing Climate Prediction (HD(CP)2) project is to improve climate model predictions by means of process studies of clouds and precipitation. This study makes use of observed elevated moisture layers as a proxy of future changes in tropospheric humidity. The associated impact on radiative transfer triggers fast responses in boundary layer clouds, providing a framework for investigating this phenomenon. The investigation will be carried out using data gathered during the Next-generation Aircraft Remote-sensing for VALidation (NARVAL) South campaigns. Observational data will be combined with ECMWF reanalysis data to derive the large scale forcings for the Large Eddy Simulations (LES). Simulations will be generated for a range of elevated moisture layers, spanning a multi-dimensional phase space in depth, amplitude, elevation, and cloudiness. The NARVAL locations will function as anchor-points. The results of the large eddy simulations and the observations will be studied and compared in an attempt to determine how simulated boundary layer clouds react to changes in radiative transfer from the free troposphere. Preliminary LES results will be presented and discussed.