



## **The Use of Sparse Field-Campaign Data to Configure LES in the Subtropical Atlantic**

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Observed data, recorded during field campaigns conducted in regions where observations are generally scarce, can be used to make large-eddy simulations more representative of the local conditions. In this study the Dutch Atmospheric Large-Eddy Simulation (DALES) model is used to generate a set of 36 simulations at the locations of 11 dropsondes launched during the Next-generation Aircraft Remote sensing for Validation Studies (NARVAL) Campaign's fourth Research Flight, which took place on December 14th 2013. The 36 simulations are divided into a set of control experiments, a set of simulations with the dropsonde profiles blended into the GCM-derived large-scale forcings, and a set of sensitivity experiments. Two metrics have been used to study the impact of blending the dropsonde profile into the large-scale forcings. The first metric is designed to quantify the impact on the boundary layer deep structure. The second metric is a new probabilistic method designed to allow a fair statistical comparison of inversion properties between point-measured observation soundings and 3-dimensional LES field. The 14 simulations generated as part of the sensitivity experiment are divided between three sub-categories: a) the nudging time-scale intensity, b) the length of the nudging time-window, and c) the vertical resolution of the LES. Results from these simulations indicate a strong evolution of the boundary layer on hourly time scales, which supports observations at the Barbados Cloud Observatory. The boundary layer deep structure is improved by including the dropsonde profiles in the large-scale forcings. On the other hand, the impact of nudging the simulation towards the dropsonde on the inversion strength is less strong. The simulations are currently being compared to additional observations recorded by instrumentation on-board the High Altitude and Long Range Aircraft (HALO), including the HALO Microwave Package (HAMP), and will be discussed in the presentation.