Geophysical Research Abstracts
Vol. 18, EGU2016-12934, 2016
EGU General Assembly 2016

Characterization of shallow marine convection in subtropical regions by airborne and spaceborne lidar measurements

Silke Gross (1), Manuel Gutleben (1,2), Andreas Schäfler (1), Christoph Kiemle (1), Martin Wirth (1), Lutz Hirsch (3), and Felix Ament (4)

(1) DLR, Institut für Physik der Atmosphäre, Wessling, Germany (silke.gross@dlr.de), (2) University of Innsbruck, Innsbruck, Austria, (3) Max-Planck-Insitut für Meteorologie, Hamburg, Germany, (4) University of Hambrug, Hamburg, Germany

One of the biggest challenges in present day climate research is still the quantification of cloud feedbacks in climate models. Especially the feedback from marine cumulus clouds in the boundary layer with maximum cloud top heights of 4 km introduces large uncertainties in climate sensitivity. Therefore a better understanding of these shallow marine clouds, as well as of their interaction with aerosols and the Earth's energy budget is demanded. To improve our knowledge of shallow marine cumulus convection, measurements onboard the German research aircraft HALO were performed during the NARVAL (Next-generation Aircraft Remote-sensing for Validation studies) mission in December 2013. During NARVAL an EarthCARE equivalent remote sensing payload, with the DLR airborne high spectral resolution and differential absorption lidar system WALES and the cloud radar of the HAMP (HALO Microwave Package) as its core instrumentation, was deployed. To investigate the capability of spaceborne lidar measurements for this kind of study several CALIOP underflights were performed.

We will present a comparison of airborne and spaceborne lidar measurements, and we will present the vertical and horizontal distribution of the clouds during NARVAL based on lidar measurements. In particular we investigate the cloud top distribution and the horizontal cloud and cloud gap length. Furthermore we study the representativeness of the NARVAL data by comparing them to and analysing a longer time series and measurements at different years and seasons.