



Liquid water content variation with altitude in clouds over Europe

Boscornea Andreea (1,2) and Stefan Sabina (1)

(1) University of Bucharest, Faculty of Physics, P.O.BOX MG-11, Magurele, Romania (boscornea.a@gmail.com), (2)
National Institute for Aerospace Research "Elie Carafoli" INCAS - Bucharest, Romania

Cloud water content is one of the most fundamental measurements in cloud physics. Knowledge of the vertical variability of cloud microphysical characteristics is important for a variety of reasons. The profile of liquid water content (LWC) partially governs the radiative transfer for cloudy atmospheres, LWC profiles improves our understanding of processes acting to form and maintain cloud systems and may lead to improvements in the representation of clouds in numerical models. Presently, in situ airborne measurements provide the most accurate information about cloud microphysical characteristics. This information can be used for verification of both numerical models and cloud remote sensing techniques.

The aim of this paper was to analyze the liquid water content (LWC) measurements in clouds, in time of the aircraft flights. The aircraft and its platform ATMOSLAB - Airborne Laboratory for Environmental Atmospheric Research is property of the National Institute for Aerospace Research "Elie Carafoli" (INCAS), Bucharest, Romania. The airborne laboratory equipped for special research missions is based on a Hawker Beechcraft - King Air C90 GTx aircraft and is equipped with a sensors system CAPS – Cloud, Aerosol and Precipitation Spectrometer (30 bins, 0.51-50 m). The processed and analyzed measurements are acquired during 4 flights from Romania (Bucharest, 44°25'57"N 26°06'14"E) to Germany (Berlin 52°30'2"N 13°23'56"E) above the same region of Europe. The flight path was starting from Bucharest to the western part of Romania above Hungary, Austria at a cruise altitude between 6000-8500 m, and after 5 hours reaching Berlin. In total we acquired data during approximately 20 flight hours and we presented the vertical and horizontal LWC variations for different cloud types. The LWC values are similar for each type of cloud to values from literature. The vertical LWC profiles in the atmosphere measured during takeoff and landing of the aircraft have shown their dependence of the meteorological parameters.