

Consistent calibration and data quality control of ground-based microwave radiometer for a network use

Bernhard Pospichal, *University of Cologne*
Ulrich Löhnert, *University of Cologne*

Ground-based microwave radiometers (MWR) have become a well-established technique in atmospheric remote sensing for obtaining cloud liquid water path, integrated water vapor, as well as boundary layer thermodynamic profiles. These instruments operate continuously at many sites throughout the world and have proven to be a valuable tool for both process studies and the operational use by assimilating MWR data into numerical weather prediction models.

However, the quality of MWR data strongly depends on a well-characterized calibration, a thorough uncertainty assessment as well as extensive data quality control.

During the last few years, several MWR intercomparison campaigns have been performed in Europe in order to assess different calibration methods and to reduce calibration uncertainties. Recommendations for MWR operators for calibration and optimal measurement settings have been compiled together with methods to calculate the correlated and random uncertainties for individual instruments.

In the frame of the Cloudnet project it is planned to establish a common data processing and quality control chain from instrument level to atmospheric products. Cloudnet is a network of more than 15 stations across Europe which are equipped at least with a MWR, a Doppler cloud radar as well as ceilometer and wind lidar and is part of the research infrastructure initiative ACTRIS which gathers sites for cloud, aerosol and trace gas observations in Europe. Cloudnet aims to provide sustainable, and continuous high-resolution cloud information. In this context, the installation of a best practice center for MWR is planned at JOYCE-CF (Jülich Observatory for Cloud Evolution) operated by the University of Cologne to ensure comparable data from different sites and instruments.

We will give an overview of current methods of MWR calibration and data quality control and the developments in the fields of calibration and uncertainty assessment during the recent years. Some measurement examples from the Cloudnet stations as well as from data assimilation studies will be presented to show the impact of a harmonized network operations of MWR.