

Data assimilation from a continental-scale network of ground-based microwave radiometers into NWP

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Nowadays, ground-based microwave radiometers (MWR) are robust instruments providing continuous unattended operations and real time atmospheric observations under nearly all-weather conditions.

However, the use of MWR data for assimilation into Numerical Weather Prediction (NWP) models has been limited to a few sporadic cases.

In the framework of the EU COST Action TOPROF (Towards operational ground based profiling with ceilometers, doppler lidars and microwave radiometers for improving weather forecasts), a working group dedicated to MWR was established (WG3). WG3 aims at developing the tools and data cycle for experimenting the assimilation of observations from a continental scale network of ground-based MWR into NWP.

In this presentation we will:

1) discuss the results from a data assimilation (DA) trial exploiting temperature and humidity profiles from 13 MWR in the European western Mediterranean region into the Mètèo-France Arome NWP system;

2) introduce the development of a fast radiative transfer model (RTTOV-gb), adapted from NWP Satellite Application Facility RTTOV software package, to simulate ground-based MWR observations and Jacobians;

3) demonstrate the implementation of RTTOV-gb into a one-dimensional variational scheme (1DVAR) to retrieve temperature and humidity profiles from MWR observations;

4) present latest results of observations-minus-background (O-B) analysis for a set of MWR from an European continental-scale MWR network.

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Preferences:

-Oral presentation

-Topic: "Operational Ground-based Profiling for Improving Weather Forecast"