

Developments in the all-sky assimilation of microwave imagers at ECMWF

Tracy Scanlon⁽¹⁾, Alan Geer⁽¹⁾, Niels Bormann⁽¹⁾

(1) European Centre for Medium-Range Weather Forecasts

The all-sky assimilation of microwave imagers is continually under development to exploit the contribution of these sensors to the ECMWF-IFS (Integrated Forecast System). This work summarises several recent developments focusing on the addition of new data and the improvement of the simulated brightness temperatures (BTs) from RTTOV-SCATT.

Data from the imaging channels of the SSMIS on-board DMSP-18 (F18) have been introduced for the first time to complement those from F17. The inclusion of this data has shown improvements (in the O-B statistics) and work is ongoing to assess the impact taking into account difficulties previously encountered when adding more than 3 or 4 all-sky microwave imagers, as well as looking into potential differences in the 12 hours to 4-day forecast resulting from the addition of the new sensor.

The hydrotables generated by RTTOV-SCATT describe the bulk hydrometeor optical properties as a function of temperature, water content and sensor channel. The impact of increasing the range of the hydrotables for both the temperature (from 70 to 100 levels to allow the lower temperatures) and the water content (from 401 levels to 501 to allow higher water content) has been assessed. The aim of these changes is to improve the representation of tropical convection with a focus on anvil clouds.

Finally, the representation of clouds within RTTOV-SCATT has been altered to allow a better representation of the spreading of convective cores and the transition to anvil cloud above the freezing level using linear interpolation. The aim is to try to correct a longstanding underestimation of the deep convective scattering signal in the tropics for the all-sky BT simulations.