

Evaluation of AMSR3 precipitation-sensitive observations and preparation for the assimilation of EPS-SG MWI and WSFM MWI at ECMWF

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Observations from passive microwave imagers play a crucial role in Numerical Weather Prediction (NWP), particularly within the Integrated Forecasting System (IFS) of the European Centre for Medium-Range Weather Forecasts (ECMWF). These instruments provide essential information on hydrometeors, and their assimilation across microwave frequencies from 6 GHz through to 190 GHz constrains aspects of precipitation from heavy rain through to frozen particles in deep convection. Comparison between these observations and the forecast models also helps reveal biases and limitations in the physical modelling. To further exploit both current precipitation-sensitive microwave observations and future missions, it is necessary to continue developing the assimilation system.

In this regard, studies are being conducted on AMSR3, the successor to AMSR2, flown on the GOSAT-GW satellite launched in June 2025. This work includes a detailed evaluation of AMSR3 on several key aspects to prepare its operational assimilation: quality-control behaviour, radio-frequency interference (RFI) screening, bias characteristics, and observation-error modelling. The impact of assimilating AMSR3 channels within the IFS will also be presented.

Further work will include the assimilation of data from for the upcoming EUMETSAT Polar System - Second Generation Microwave Imager (EPS-SG MWI), scheduled for launch in summer 2026, along with preparations for Weather System Follow-on Microwave - Microwave Imager (WSFM MWI).