

Toward the assimilation of the future MTG-IRS data in a fine-scale weather forecast model : Potential benefits

Stephanie Guedj, Florence Rabier and Vincent Guidard

CNRM/GAME, Météo-France and CNRS / EUMETSAT, 42 av Coriolis, 31057 Toulouse, France
stephanie.guedj@cnrm.meteo.fr

The future MTG-IRS (Meteosat Third Generation – Infra-Red Sounder) mission is directed by ESA and EUMETSAT to support regional and convective-scale numerical weather prediction in Europe. This instrument will provide unprecedented information on the temperature and humidity, at high vertical, horizontal and temporal resolution.

However, today's assimilation systems are not designed to use such a amount of data that will be available from MTG-IRS. One reason is the assumption made on observation errors within the variational systems. In fact, it is wrongly assumed that the error in a radiance observations are independent (in space and wavelength). To neglect such a correlation may result in a degradation of the analysis, so that satellite radiances are thinned spatially and the observation errors are inflated.

The future MTG-IRS data are expected to carry horizontal and inter-channel error correlations. Available data from MSG-SEVIRI and Metop-IASI observations at full resolution were used to quantify these potential correlations following various scenarios. In parallel, MTG-IRS data have been simulated using a radiative transfer model and a set of atmospheric profiles. Simulations/retrievals were evaluated against independent observations/models.

In the framework of an Observing System Simulation Experiment, simulated MTG-IRS observations were assimilated in a special version of the AROME forecast model. Improvements are investigated with respect to standard measures, mainly with respect to precipitation fields and moisture convergence over the Mediterranean sea.