

4th workshop on assimilating satellite cloud and precipitation observations for NWP



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Assimilation of microwave observations of cloud and precipitation through a bayesian framework : sensitivities studies

Microwave observations are becoming more and more useful for numerical weather prediction ; in particular in an all-sky context which is under development at Météo-France. Indeed those observations can bring highly relevant information content on the vertical distribution of water vapor and hydrometeors. The method under investigation at Meteo-France is called the '1D-Bay+4D-Var' and corresponds to a two step process : (i) a Bayesian inversion algorithm to retrieve profiles of temperature and humidity from the microwave radiances using the RTTOV-SCATT observation operator, (ii) the 4D-Var assimilation of these retrieved profiles. The first assimilation experiments using this framework result in a good impact on forecast scores especially on wind forecast. However, many parameters need to be specified for the inversion process like scattering properties of hydrometeors, channels used within the inversion, observation errors in the R-matrix or the choice of the estimator (e.g. maximum likelihood / weighted average). In this poster, sensitivities studies of the Bayesian inversion to the parameters mentioned above will be presented. Those sensitivities studies will be based on AROME model simulations and GMI observations. Results highlight the importance of selecting the pressure levels of the retrievals to be assimilated depending on the channels used for the inversion process.

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