



Atmospheric chemistry in the integrated forecast system of ECMWF

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As part of the MACC and MACC II projects ECMWF's integrated forecast system (IFS) has been extended by flexible modules for chemistry, deposition and emission of reactive gases. This integration of the atmospheric chemistry in IFS (C-IFS) complements the integration of aerosol processes, which started in the GEMS-project. The MACC system provides global analyses and forecasts of atmospheric composition. Its main motivation is to utilize the IFS for the assimilation of satellite observations of atmospheric composition. Further, it is a research platform to study the interaction between atmospheric composition and meteorology at high resolution on the global scale.

We present C-IFS applying the extended CBM4/EQSAM and the RACMOBUS chemical mechanisms of the global CTMs TM5 and MOCAGE. We present how C-IFS compares against the stand-alone CTMs and a comprehensive set of observations (satellite retrievals, surface observations and flight observations). We demonstrate the benefit of the on-line integration by focusing on processes of wet deposition, which make full use of the comprehensive simulation of clouds, precipitation and convection by the IFS.