



Chemistry and aerosol model development for the Copernicus Atmosphere Monitoring Service at ECWMF

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The global forecast and data assimilation system for atmospheric composition of the Copernicus Atmosphere Monitoring Service (CAMS) is part of ECMWF's integrated forecasting system (IFS). The CAMS system is run on a lower resolution (40 km) than the operational Numerical Weather Prediction (NWP) suite (9km), but it uses the same meteorological model for both configurations in order to maintain a seamless approach to earth-system forecasting. The IFS with the modules for atmospheric composition is referred to as C-IFS.

Although developments of the chemistry and aerosol modules are by far the most important reasons for changes in the simulation of atmospheric composition with C-IFS, the impact of continuous developments of the meteorological part of C-IFS also introduces changes to the operational composition forecast. The development of the IFS is predominantly driven by the improvements in weather prediction scores at high resolution. IFS model upgrades occur several times a year.

In the presentation we will address the opportunities and challenges to improve the quality of the CAMS operational composition forecasts as part of a steadily changing operational NWP system.

We will discuss examples on how changes in the IFS model impact the composition simulation such as changes to the convection scheme, lightning activity and surface processes. We will also provide a detailed break down of the additional computational cost of the atmospheric composition simulation.