



## **Sensitivity of tropospheric photochemistry to aerosol analyses**

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Tropospheric reactive gases are well known to be sensitive to aerosol concentrations and distributions in the atmosphere through their impact on photolysis rates and heterogeneous reactions. Therefore an online reactive gases and aerosol scheme is likely to improve the forecasts of tropospheric ozone and its precursors. Within the (EU-FP7) MACCII-project, we have integrated modules for the modeling of reactive gases within ECMWF's integrated forecast system. This is referred to as Composition-IFS (C-IFS). An interaction of the photochemistry with the aerosol processes, already present in IFS, is now established, where we can additionally make use of the IFS data-assimilation capabilities. Using actual observations of aerosol optical depth increases the realism of the day to day variability in aerosol composition, and hence its variable impact on tropospheric reactive gases.

Aerosol properties as modeled with the IFS aerosol model are initialized daily from the MACC reanalysis, which are constrained by assimilated MODIS observations. Tropospheric chemistry is described by the modified CB05 chemistry mechanism as adopted from the chemistry transport model TM5, which applies an explicit on-line parameterization for the calculation of photolysis rates. With this system we evaluate the impact of aerosols on photochemistry on a global scale, for the year 2008.