



Validation of gas phase chemistry modules used in WRF/chem model on domain including Europe

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Numerical models of atmospheric physics and chemistry are important tools for investigating links between atmospheric composition, weather and emission sources. WRF/chem (Weather Research and Forecasting/Chemistry) is a mesoscale non-hydrostatic meteorological model online coupled with chemical transport model. This work presents evaluation of two one-year simulations with different gas phase chemistry modules (CBMZ and RADM2) on domain including the whole Europe with horizontal resolution of 25 km. The results of physical part of model are evaluated by E-OBS database, validation of chemical part of model is performed using EMEP and Airbase databases.

The main goal of this work includes evaluation of ozone, nitrogen oxides, carbon monoxide and formaldehyde amount, together with analyzing of some connections between their concentrations and sources. The time averaged concentrations of these gases look well, but the time coincidence of model and reference series is not so high, also the total variability of model series is not as high as in term of reference time series. One part of this work is also dedicated to examination of links between total emissions (anthropogenic or biogenic) of non-methane volatile organic compounds (VOC), nitrogen oxides (in term of both emission and concentration) and total amount of formaldehyde in atmosphere.