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# Evaluation and comparison of $O_3$ and PM10 forecasts of ALARO-CAMx and WRF-Chem

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ZAMG runs two models for Air-Quality forecasts operationally: ALARO-CAMx and WRF-Chem.
ALARO-CAMx is a combination of the meteorological model ALARO and the photochemical dispersion model CAMx and is operated at ZAMG by order of the regional governments since 2005. The emphasis of this modeling system is to predict ozone peaks in the North-east Austrian flatlands. Two modeling domains are used with the highest resolution (5 km) in the Alpine region. Various new features have been implemented in the model in the past to improve the daily forecasts, e.g. data assimilation of $O_3$ and PM10 observations from the Austrian measurement network (with optimum interpolation technique), MACC-II boundary conditions and the combination of high resolved emission inventories for Austria with TNO and EMEP data. The biogenic emissions are provided by the SMOKE model. The model runs 2 times per day for a period of 48 hours.
The second model which is operational is the on-line coupled model WRF-Chem. Meteorology is simulated simultaneously with the emission, turbulent mixing, transport, transformation as well as the fate of trace gases and aerosols. 2 domains are used for the simulations. The mother domain covers Europe with a resolution of 12 km. The inner domain includes the Alpine region with a horizontal resolution of 4km. The model runs 2 times per day for a period of 72 hours and is initialized with ECMWF forecasts.
The evaluation of both models is conducted for the months January to September 2016 with the main focus on the forecasts of ozone. The measurements of the Air-Quality stations are compared with the area forecasts for every province of Austria. Besides the evaluation a comparison of the forecasts of ALARO-CAMx and WRF-Chem is done. The summer 2016 was one of the 11th warmest summers since the beginning of the meteorological measurements in Austria, but one of the 15th rainiest summers, too. Due to the meteorological conditions, only two exceedances of the information threshold (180 $\mu g/m^3$) and one very local and short exceedance of the alert threshold (240 $\mu g/m^3$) were measured (June 2016). In addition, the daily and monthly means of the PM10 forecasts are compared with the measurements.