Long term analysis of surface ozone from EMEP station and comparison with GEM-AQ

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Since the late 1970s, air pollution has been one of the main environmental concerns in Europe. During the last decade, the European Union has adopted a wide range of air quality policies, including the directive on ozone (2002/3/EC). The EMEP program, developed under the Convention on Long-range Transboundary Air Pollution, also contributes to European policy-relevant research in this field. Apart from other activities, EMEP provides air pollution monitoring in Europe.

The analysis of ozone concentrations collected at EMEP stations shows a typical pattern with maximum values during spring or early summer and minimum values in winter. The seasonal variation of ozone seems to be related to the geographical location of the stations. Regional and global models' simulations help us to understand the nature of this variability, and to investigate the impact of different processes such as dry deposition, photochemical loss and formation, influx from the stratosphere and varying background ozone concentrations.

The on-line air quality and tropospheric chemistry model GEM-AQ has been run for 5 years (2001-2005) on a global uniform 1.5x1.5 degree resolution domain (240 x 120 grid points) and 28 hybrid levels extending to 10hPa. The results have already been evaluated with available satellite datasets and the ozone climatological vertical profiles.

The aim of this study is to extend the model evaluation with in-situ measurements and to estimate the accuracy of the global emission datasets over Europe. Due to the low model resolution, EMEP monitoring stations located in the mountains and coastal areas will be excluded from the analysis. Model performance will be investigated using

power spectrum analysis and several accuracy measures. An attempt will be made to interpret the observed and modelled seasonal and inter-annual variability, as well as regional distribution of ozone concentration in Europe.