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# Coupling atmospheric chemistry-aerosols to regional climate model in high resolution

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Recently the effects of climate change on air-quality and vice-versa are studied quite extensively. In fact, even at regional and local scale especially the impact of climate change on the atmospheric composition and photochemical smog formation conditions can be significant when expecting e.g. more frequent appearance of heat waves etc. For the purpose of qualifying and quantifying the magnitude of such effects and to study the potential of climate forcing due to atmospheric chemistry/aerosols on regional scale, the development of coupling of regional climate model and chemistry/aerosol model has been started recently on the Department of Meteorology and Environmental Protection, Faculty of Mathematics and Physics, Charles University in Prague. Regional climate simulations are calculated using model RegCM while chemistry and aerosols are solved by model CAMx. Meteorological fields generated by RegCM drive CAMx transport, dry/wet deposition as well as the chemistry of the species. A pre-processor utility was developed on the department for transforming RegCM provided fields to CAMx input fields and format. As the first step, off-line one way coupling enable the simulation of distribution of pollutants over longer period of years. One way coupling on lower resolution is compared with the high resolution simulation at 10 km nested into the lower resolution run to have better boundary conditions both for meteorology and chemistry. Reasonable improvement of the results can be seen with respect to lower resolution run and departures from measured values on selected air-quality stations. Sensitivity of the model couple to the development of urban and industrialized areas, transportation as well as the impact of changes in natural emissions due to land use changes for the central Europe is studied for the EC

projects QUANTIFY and CECILIA as well.