



## **Regional-to-Urban Enviro-HIRLAM Downscaling for Meteorological and Chemical Patterns over Chinese Megacities**

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Due to strong economic growth in the past decades, air pollution became a serious problem in megacities and major industrial agglomerations of China. So, information on air quality in these urbanized areas is important for population. In particular, the metropolitan areas of Shanghai, Beijing, and Pearl River Delta are well known as main regions with serious air pollution issues. One of the aims of the EU FP7 MarcoPolo project is to improve existing regional-meso-urban/city scale air quality forecasts using improved emission inventories and to validate modelling results using satellite and ground-based measurements.

The Enviro-HIRLAM (Environment - HIgh Resolution Limited Area Model) adapted for the Shanghai region of China is applied for forecasting. The model is urbanized using the Building Effects Parameterization module, which describes different types of urban districts such as industrial commercial, city center, high density and residential with its own characteristics. For sensitivity studies, the model was run in downscaling chain from regional-to-urban scales at subsequent horizontal resolutions of 15-5-2.5 km for selected dates with elevated pollution levels and unfavorable meteorological conditions.

For these dates, the effects of urbanization are analyzed for atmospheric transport, dispersion, deposition, and chemical transformations. The evaluation of formation and development of meteorological and chemical/aerosol patterns due to influence of the urban areas is performed. The impact of selected (in a model domain) megacities of China is estimated on regional-to-urban scales, as well as relationship between air pollution and meteorology are studied.