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MONITORING AND ASSESSMENT OF REGIONAL AIR QUALITY IN CHINA USING SPACE OBSERVATIONS (MARCO POLO)

Abstract

In this paper we will present the FP7-project 'Marco Polo'. The main objective of 'Marco Polo' is to improve air quality monitoring, modeling and forecasting over China using satellite data. During the project a new emission inventory will be constructed by combining Chinese and European expertise. It will be based on recent satellite data and GISS information.

Due to the strong economic growth in the China in the past decade, air pollution has become a serious issue in many parts of the country. For this reason up-to-date regional air pollution information and means of emission control for the main pollutants are becoming more and more important.

Within a previous FP6-project, 'Air Quality Monitoring and Forecasting in China' (AMFIC), atmospheric environmental monitoring over China was addressed by a team of both Chinese and European scientists. Within 'AMFIC' it was concluded that modeling of air quality and therefore the forecast capabilities are hampered by the rapidly changing emission data due to economic growth. In addition, air quality measures could not directly be related to changes in emissions.

Therefore, within this follow-up proposal, 'Marco Polo', the focus will be placed on emission estimates from space and the refinement of these emission estimates by spatial downscaling and by source sector apportionment. A wide range of satellite data will be used from various satellite instruments. From these satellite data, emission estimates will be made for NOx, SO2, PM and biogenic sources.

With various state-of-the-art techniques, emission inventories will be created and compared. By combining these emission data with known information from the ground, a new emission database for 'Marco Polo' will be constructed. The improved emission inventory is input to regional air quality models. Within 'Marco Polo' we will have a monthly update of the emissions based on the latest satellite observations. This will improve the existing air quality modeling and forecasts. We will demonstrate the resulting air quality information by running models on both meso- and urban scale. End-users and decision makers will be informed about air quality via visualized model results and forecasts.