



## **Satellite-derived spatial and temporal variation of aerosols over China**

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The main objective of the EU-FP7 project MarcoPolo is to improve air quality monitoring, modelling and forecasting over China using satellite-retrieved observations of aerosols,  $\text{NO}_x$ ,  $\text{SO}_2$ , and biogenic gases. This information will be used to derive emission estimates which will be used together with known information from the ground-based measurements, to construct an emission database for use with regional and local air quality models. In this contribution we report on the use of satellite data to obtain information on the occurrence of aerosols over China. Several different instruments, in particular MODIS and AATSR, are used to provide the spatial AOD since 2002. A merged AOD product, constructed from AOD retrieved from several instruments, is used to provide improved coverage. CALIOP is used to provide information on the vertical structure of aerosols, including aerosol type information in particular on dust. The AOD data sets are validated and evaluated versus sun photometer data from AERONET and the Chinese network CARSNET. This is particularly valuable because aerosol retrieval algorithms are developed and validated over areas where many independent ground-based observations are available, such as over the eastern USA and Europe. However, over these areas the AOD levels are often relatively low as compared to China where the occurrence of very high AOD, combined with the variation in aerosol type and surface characteristics, poses particular problems as regards data selection and discrimination between high AOD and the occurrence of clouds. An initial analysis of the spatial and vertical variability of the AOD is provided and time series showing the variation over representative areas are presented, combining the various information sources indicated above. AOD time series will be compared with those from precursor gases and model estimates.