Influences from weather versus emission reductions to improve air quality

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Impacts of urban air pollution in Megacities are issues which will have major consequences to the life quality. In view of the ongoing climate change – which will amplify environmental problems – it is important to convene with regional and local stakeholders in order to introduce suitable measures and to reduce and minimize air pollution levels and health impacts.

We studied air quality in Beijing. It is one motivation that aeolian mineral dust originated from the West and Northwest of China is of high peak in varying degrees during the spring of each year. It is believed that these dust storms carry also significant quantities of pollutants. PM is an air pollutant associated with adverse effects on human health. Further, during the

spring festival a real holiday situation exists each year in January/February. This situation will be analyzed to study the results of possible anthropogenic mitigation measures.

KIT/IMG and DWD investigate the inorganic composition of $PM_{2.5}$ based on weekly passive samples and active samples in a continuous measurement series at CUGB since 2005. Daily $PM_{2.5}$ samples were collected continuously at that site from June 2010 until June 2011 (KIT/IMK-IFU together with CUTMB) to determine carbon fraction, organic speciation (HMGU, UR), isotopic composition (KIT/IMK-IFU) and inorganic composition (KIT/IMG). To study the diurnal variation of gaseous pollutants like NO, NO_2 and O_3 and compounds which are of interest for secondary aerosol formation like SO_2 a DOAS (Differential Optical Absorption Spectroscopy) was operated at CAS/IAP near a motorway from April 2009 until March 2011. Furthermore, a Vaisala ceilometer is used to analyse the diurnal development and variation of the mixing layer height.

It can be concluded that an important part of the variation of the observed PM, SO_2 and NO_2 concentrations is caused by the MLH, apart from the meteorological (e.g. wind), emission (e.g. SO_2) and photochemistry dependences.