



## **Satellite observations of changes in air quality at mega-events in China**

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In the last three decades, China's rapid economic growth has resulted in an increase in energy consumption, air pollution and associated health effects. From 2007, the 2008 Olympic Games, the Expo 2010 and the 2010 Asian Games have been held in Beijing, Shanghai and Guangzhou which are important megacities in China respectively. These mega-events which draw millions of local and international visitors to the host cities give these cities a chance to highlight air quality improvements in the long- and short- term. To improve the air quality during these mega-events, many emission control measures (ECMs) focusing on energy, industry, transport and construction were implemented by host cities before and during the mega-events. Satellite observations will provide unique insight into the regional air quality around host cities and air pollution transport from surrounding provinces.

In this work, we present an investigation of air quality over Beijing, Shanghai and Guangzhou before, during and after the Olympic Games, the Expo 2010 and the 2010 Asian Games using satellite measurements. The Global Ozone Monitoring Experiment-2 (GOME-2) is one of the new-generation European instruments carried on the MetOp satellite, which will continue the long-term atmospheric composition measurements started by GOME on ERS-2 and SCIAMACHY on Envisat. The GOME-2 ozone and minor trace gases products such as NO<sub>2</sub>, SO<sub>2</sub> and formaldehyde (CH<sub>2</sub>O) developed at German Aerospace Center have already reached operational status, in the framework of the EUMETSAT's Satellite Application Facility on Ozone and Atmospheric Chemistry Monitoring (O3M-SAF).

GOME-2 tropospheric NO<sub>2</sub>, CH<sub>2</sub>O and SO<sub>2</sub> products are used to study air quality of the host cities before, during, and after their respective mega-events. The effect of air pollution transport from neighboring provinces to mega-events host cities will be researched. Initial comparison with ground based measurements (in-situ) in Beijing, Shanghai and Guangzhou will be shown. Long-term NO<sub>2</sub>, SO<sub>2</sub> and CH<sub>2</sub>O data recorded from GOME, SCIAMACHY and GOME-2 are analyzed to investigate possible trends in air pollutants and to assess the effectiveness of the controls applied by host cities in the last ten years.