

EARTH OBSERVATION SYMPOSIUM (B1)  
Earth Observation Applications and Economic Benefits (5)

Author: Mr. Hugo Denier van der Gon  
TNO, The Netherlands

Mr. Antoon Visschedijk  
TNO, The Netherlands

Mr. Chris McLinden  
Environment Canada, Canada

Mr. Vitali Fioletov  
Environment Canada, Canada

Mr. Len van der Wal  
TNO, The Netherlands

IDENTIFICATION AND CROSS-CHECKING OF LARGE POINT SOURCE SO<sub>2</sub> EMISSIONS IN  
EUROPE USING OMI RETRIEVALS

**Abstract**

European SO<sub>2</sub> emissions from large points sources (LPS) were cross-checked with satellite SO<sub>2</sub> measurements from the Ozone Monitoring Instrument (OMI) on NASA's EOS-Aura satellite, averaged over a period of several years. Coordinates of the top-100 individual LPS in Europe were taken from the TNO point source database and corresponding OMI SO<sub>2</sub> plots (ca. 100 x 100 km) were made. From the top-10 emitters in the LPS database, only ca. 50% was clearly identifiable. To interpret this surprising mismatch we compiled corresponding OMI NO<sub>2</sub> plots and investigated on a plant by plant basis. This supported various improvements in the representation of LPS in the TNO-MACC emission inventory used in the GMES Atmospheric Core Service.

Some plants had shifted from coal to gas and were no longer (large) SO<sub>2</sub> emitters but could be clearly identified in the OMI NO<sub>2</sub> retrievals. In some cases the coordinates of the LPS were incorrect or allocation of emission to a LPS within the country was incorrect. In the latter case, the national SO<sub>2</sub> emission was maintained but the location of emission should be adjusted. It was previously demonstrated that individual sources (or multiple sources within 50 km) with annual SO<sub>2</sub> emissions greater than about 70 kT y<sup>-1</sup> produce a statistically significant signal in 5-year averaged OMI data. When we used this threshold to verify the European Pollutant Release and Transfer Register (E-PRTR) reported emissions, most plants with emissions larger than 50-70 kT y<sup>-1</sup> could be identified.

Thus the use of OMI SO<sub>2</sub> retrievals is a promising tool for monitoring and identification of LPS emissions, especially in regions where high quality emission data is missing. However, we also established that in the case of Europe LPS only account for 25-30% of the total annual SO<sub>2</sub> emission. Combining the traditional emission inventory approach with novel satellite retrieval interpretations provides added value, which may increase when satellite data with a better sensitivity to SO<sub>2</sub> become available.