



## **Quantification of industrial VOC emissions in China using Solar Occultation Flux (SOF)**

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As a part of a comprehensive measurement campaign in Beijing during the spring 2016, a two week study to quantify industrial VOC emissions from industrial sources using the Solar Occultation Flux (SOF) method was undertaken in Tianjin. Located approximately 100 km east of Beijing, Tianjin is the largest port in northern China and the largest hub of oil and petrochemical industries in the area. The aim of the study was to investigate how well industrial VOC emissions are accounted for in emission inventories, and the importance of these emissions for the formation of photochemical smog and secondary aerosols.

The SOF method is based on absorption spectroscopy of direct infrared sunlight, which is performed from a measurement van, while driving through emission plumes containing the species of interest. Using the measured gas columns in the plume, GPS information of the movement of the van and wind measurements, the total flux of the species can be calculated. The method has previously been used to quantify VOC emissions from a large number of oil refineries and petrochemical industries in Europe, North America and the Middle East.

Preliminary emission rates of alkanes as well as number of alkenes, such as ethene, propene, 1,3-butadiene and vinyl chloride has been compiled for most of the largest industrial sources in the Tianjin area. These emissions have been incorporated into a Lagrangian atmospheric chemistry model along simulated trajectories passing Tianjin on their way to Beijing. This has yielded some preliminary results for the total impact of these emissions on photochemical smog in the area.