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Two years of MAXDOAS measurements of NO_2, HONO, SO_2 and HCHO at SORPES station in Nanjing, China

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The Yangtze River Delta (YRD) region includes the mega-city Shanghai and the well-industrialized and urbanized areas of Zhejiang Province and Jiangsu Province, with over ten large cities, such as Hangzhou, Suzhou and Nanjing. Covering only 2% land area, this region produces over 20% of China's Gross Domestic Product (GDP) which makes it the most densely populated region and one of the most polluted regions in China. In the YRD region, knowledge gaps still exist in the understanding of the source and transport of air pollutants because only few measurement studies have been conducted.

This work presents two years measurements of air pollutants including NO_2, HONO, SO_2, HCHO and CHOCHO at a regional back-ground site, the Station for Observing Regional Processes of the Earth System (SORPES), in the western part of the Yangtze River Delta (YRD) in eastern China. A retrieval algorithm, based on an on-line implementation of the radiative transfer code LIDORT and the optimal estimation technique, has been used to provide information on trace gases vertical profiles and vertical column densities (VCDs). The seasonal and diurnal cycles of trace gases have been studies and compared with in situ measurements. The retrieved tropospheric NO_2, HCHO and SO_2 VCDs were compared to satellite measurements, while the NO_2 and SO_2 near surface concentrations (0-200 m layer) were compared to measurements from in situ instruments at SORPES.