6.138 NO2 and HCHO variability in Mexico City from MAX-DOAS measurements.

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Abstract:

Atmospheric studies in large cities are of great relevance since pollution affects air quality and human health. According to the latest revision of the World Urbanization Prospects released by the Department of Economic and Social Affairs of the United Nations Secretariat, in 2014 about 80 per cent of the Latin American population lived in urban areas. Furthermore, over the coming decades urbanization is expected to increase in all regions of the world. Being the Mexico City Metropolitan Area (MCMA) one of the largest urban areas of the world with around 21 million inhabitants, to improve air quality monitoring of the MCMA atmosphere becomes a pressing matter.

A network of Multi Axis Differential Optical Absorption Spectrometers (MAX-DOAS) has been established in strategic sites within the MCMA. Four instruments are now in operation with the aim to study the variability and spatial distribution of key pollutants, providing results of nitrogen dioxide (NO_2), formaldehyde (HCHO) and the oxygen dimer (O_4) slant column densities (SCDs). A numerical code has been written to retrieve gas profiles of NO_2 and HCHO using radiative transfer simulations and to derive vertical column densities (VCDs). Preliminary results of the variability of VCDs of these trace gases in the atmosphere of the MCMA are presented, which will bring new insights to the current knowledge of the abundances of these molecules, transport patterns, emissions as well as the frequency and origin of extraordinary events. These studies complement surface measurements routinely conducted by the air quality monitoring network of the MCMA, providing information on the vertical distribution of the studied species as well as the total column amount within the boundary layer. In addition, these measurements are useful to validate current and future satellite observations such as OMI, TROPOMI and

TEMPO.