



Estimation of NO₂ emissions from Lahore and Rawalpindi / Islamabad using Car MAX-DOAS observations and comparison with OMI satellite data

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We present results of ground-based multi-axis differential optical absorption spectroscopy (MAX-DOAS) measurements performed around the cities of Lahore and Rawalpindi / Islamabad, Pakistan and also between the cities along National Highway, N5. From the car-MAX-DOAS measurements, the tropospheric vertical column density (VCD) of NO₂ is retrieved based on the so called geometric approximation. Based on observations along large circles around the cities and wind data we estimate the NO₂ emissions from the cities of Lahore and Rawalpindi / Islamabad. We also compare the spatial distributions of the tropospheric NO₂ VCDs observed by car MAX-DOAS with collocated results from the satellite based Ozone Monitoring Instrument (OMI). We discuss the influence of the observed spatial gradients on the comparison between both data sets.