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Solar-absorption measurements of ozone from two ground based FTIR sites

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Ozone reduces the amount of ultraviolet light entering earths atmosphere and continuous monitoring of total ozone column especially in higher latitudes has been a major task since the discovery of the stratospheric ozone depletion. As tropospheric ozone is a main greenhouse gas, monitoring of ozone in the lower atmosphere and also in the tropics gains importance. Tropospheric ozone also plays an important role in air quality and high levels of ozone in the boundary layer affects the public health. Ozone is produced through a complicated path of photochemistry processes from volatile organic compounds and nitrogen oxides (NO_x)[1]. In large cities, these ozone precursors are mainly emitted from anthropogenic activities and in Mexico City the ozone concentration frequently exceedes the local standard for air quality (e.g. on 80% of the days of the year 2002)[2]. Since May 2012 high resolution Fourier transform infrared solar absorption spectra have been used for determining the total column and profile of ozone at the high altitude remote site Altzomoni (19°.12‘N, 98°.65‘E) located 60 km southeast of Mexico City at 4000 m a.s.l. These measurements are complemented with solar absorption spectra recorded with a moderate resolution FTIR spectrometer at the UNAM campus in Mexcio City (19º25‘N, 99º10‘W, 2240 m a.s.l.). The vertical profiles and total columns of ozone are inferred from solar spectra by using the retrieval code PROFFIT. The results are compared with simulations of the Whole Atmosphere Community Climate Model (WACCM) and other correlative data. The ozone column amount in the polluted mixing layer of Mexico City is estimated from the intercomparison of measurements at the urban and remote sites and discussed.

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