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Intercomparison of ground-based ozone and NO_2 measurements during the MANTRA 2004 campaign

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Abstract. The MANTRA (Middle Atmosphere Nitrogen TRend Assessment) 2004 campaign took place in Vanscoy, Saskatchewan, Canada (52° N, 107° W) from 3 August to 15 September, 2004. In support of the main balloon launch, a suite of five zenith-sky and direct-Sun-viewing UV-visible ground-based spectrometers was deployed, primarily measuring ozone and NO_2 total columns. Three Fourier transform spectrometers (FTSs) that were part of the balloon payload also performed ground-based measurements of several species, including ozone. Ground-based measurements of ozone and NO_2 differential slant column densities from the zenith-viewing UV-visible instruments are presented herein. They are found to partially agree within NDACC (Network for the Detection of Atmospheric Composition Change) standards for instruments certified for process studies and satellite validation. Vertical column densities of ozone from the zenith-sky UV-visible instruments, the FTSs, a Brewer spectrophotometer, and ozonesondes are compared, and found to agree within the combined error estimates of the instruments (15%). NO_2 vertical column densities from two of the UV-visible instruments are compared, and are also found to agree within combined error (15%).

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