



## **Intercomparison of UV-visible measurements of ozone and NO<sub>2</sub> during the Canadian Arctic ACE Validation campaigns: 2004-2006**

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The first three Canadian Arctic ACE validation campaigns were held during polar sunrise at Eureka, Nunavut, Canada (80°N, 86°W) from 2004 to 2006 in support of validation of the ACE (Atmospheric Chemistry Experiment) satellite mission. Three or four zenith-sky viewing UV-visible spectrometers have taken part in each of the three campaigns. The differential slant column densities and vertical column densities from these instruments have been compared following the methods of the UV-visible Working Group of the NDACC (Network for Detection of Atmospheric Composition Change). The instruments are found to partially agree within the required accuracies for both species, although both the vertical and slant column densities are more scattered than required. This might be expected given the spatial and temporal variability of the Arctic stratosphere in spring. The vertical column densities are also compared to integrated total columns from ozonesondes and integrated partial columns from the ACE-FTS (ACE-Fourier Transform Spectrometer) and ACE-MAESTRO (ACE-Measurements of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation) instruments on board ACE. For both species, the columns from the ground-based instruments and the ozonesondes are found to generally agree within their combined error bars. The ACE-FTS ozone partial columns and the ground-based total columns agree within 4.5%, averaged over the three campaigns. The ACE-MAESTRO ozone partial columns are generally smaller than those of the

ground-based instruments, by an average of 9.9%, and are smaller than the ACE-FTS columns by an average of 14.4%. The ACE-FTS NO<sub>2</sub> partial columns are an average of 13.4% smaller than the total columns from the ground-based instruments, as expected. The ACE-MAESTRO NO<sub>2</sub> partial columns are larger than the total columns of the ground-based instruments by an average of 2.5% and larger than the partial columns of the ACE-FTS by an average of 15.5%.