COMPARISON OF ATMOSPHERIC COLUMN DENSITY MEASUREMENTS OVER EUREKA, NUNAVUT BY TWO FOURIER TRANSFORM SPECTROMETERS

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Ground-based measurements of total column densities of several species in the Arctic atmosphere have been reported by two Fourier transform spectrometers (FTSs) that took part in the 2005 Canadian Arctic Validation Campaign for the ACE (Atmospheric Chemistry Experiment) satellite mission (February 21 - March 9, 2005). This campaign took place at the Polar Environmental Arctic Research Laboratory (PEARL) near Eureka, Nunavut (80°N, 86°W). Differences have been observed between the daily mean column densities reported by PARIS-IR (Portable Atmospheric Research Interferometric Spectrometer for the Infrared operated by the University of Waterloo) and the Bomem DA8 FTS stationed at PEARL (operated by Environment Canada). These differences are largest for the stratospheric species, O_3, HCl, HF, and HNO_3. Since PARIS-IR and DA8 spectra were recorded at different spectral resolutions (0.02 cm^{-1} $vs.$ 0.004 cm^{-1}), and were analyzed using different spectroscopic data sets (HITRAN 2004 $vs.$ HITRAN 1992+updates) and retrieval programs (SFIT2 v3.91 $vs.$ SFIT1 v1.09e), we have investigated the effects of these different factors on the column density retrievals. We report our findings from this investigation for the O_3, HCl, HF, and HNO_3 retrievals.