SPECTROSCOPIC STUDY OF ATMOSPHEIC TRACE GASES USING PARIS-IR FROM WATERLOO ATMOSPHERIC OBSERVATORY IN 2005 AND 2006

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A portable high resolution Fourier transform spectrometer, named the Portable Atmospheric Research Interferometric Spectrometer for the Infrared (PARIS-IR), has been used to measure solar absorption spectra from the Waterloo Atmospheric Observatory (43.47^{o}N, 80.55^{o}W, 139 m above sea level) since summer 2005. The column densities of ozone and several trace gases involved in ozone chemistry were retrieved from these observations. The ground-based results from PARIS-IR have been compared with partial column densities retrieved from measurements near Waterloo recorded by the Canadian satellite, the Atmospheric Chemistry Experiment (ACE). The primary goal of ACE (also known as SCISAT-1) is to study ozone chemistry over polar and mid-latitude regions. It has two instruments: ACE-FTS (Atmospheric Chemistry Experiment Fourier Transform Spectrometer) and ACE-MAESTRO (Measurements of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation). These instruments have been performing solar occultation observations of the Earth's atmosphere since February 2004. Results from other ground-based instruments observing the atmosphere near Waterloo, such as a Brewer spectrophotometer, also will be compared with those from PARIS-IR and ACE. Description of seasonal atmospheric changes at mid-latitude based on these observations will be presented. Comparisons between ground-based and space-based measurements are also being used to validate the ACE observations.