



Seasonal variability of upper tropospheric acetone using ACE-FTS observations and LMDz-INCA model simulations

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The vertically-resolved distributions of oxygenated organic compounds (oVOCs) are mainly inferred from surface and airborne measurements with limited spatial and temporal coverage. This results in a limited understanding of the atmospheric budget of these compounds and of their impact on the upper tropospheric chemistry. In the last decade, satellite observations which complement in-situ measurements have become available, providing global distributions of several oVOCs. For example, Scisat-1, also known as the Atmospheric Chemistry Experiment (ACE) has measured several oVOCs including methanol and formaldehyde. ACE is a Canadian-led satellite mission for remote sensing of the Earth's atmosphere that has been in operation since 2004. The primary instrument on board is a Fourier transform spectrometer (FTS) featuring broad spectral coverage in the infrared (750-4400 cm⁻¹) with high spectral resolution (0.02 cm⁻¹). The FTS instrument can measure down to 5 km altitude with a high signal-to-noise ratio using solar occultation. The ACE-FTS has the ability to measure seasonal and height-resolved distributions of minor tropospheric constituents on a near-global scale and provides the opportunity to evaluate our understanding of important atmospheric oxygenated organic species. ACE-FTS acetone retrievals will be presented. The spatial distribution and seasonal variability of acetone will be described and compared to LMDz-INCA model simulations.