

**An intercomparison study of isotopic ozone profiles from the ACE-FTS and JEM-SMILES instruments.**

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Observations of various atmospheric isotopologue species are a valuable source of information, as they can improve our current understanding of the atmosphere. For example, isotopic signatures in atmospheric profiles can be used to investigate atmospheric dynamical processes, while differences in the isotopic composition of atmospheric trace gases can be traced to effects due to their sources and sinks. This study firstly focuses on the intercomparison of two satellite missions that provide measurements of isotopic species. The Atmospheric Chemistry Experiment-Fourier Transform Spectrometer (ACE-FTS) aboard the Canadian satellite SCISAT (launched in August 2003) was designed to investigate the composition of the upper troposphere, stratosphere, and mesosphere. ACE-FTS utilizes solar occultation to measure temperature, pressure, and vertical profiles of over thirty chemical species, including isotopologue profiles for; O<sub>3</sub>, H<sub>2</sub>O, CH<sub>4</sub>, N<sub>2</sub>O, CO, CO<sub>2</sub> and NO. Global coverage for each species is obtained approximately over one year and with a vertical resolution of typically 3-4 km. ACE-FTS O<sub>3</sub> isotopologue profiles are compared to data measured by the Superconducting Sub-Millimeter-wave Limb Emission Sounder (SMILES), onboard the Japanese Experiment Module (JEM) of the International Space Station (ISS), which was launched in September 2009. Also, we examine seasonal and year-to-year variations, using the seven years of ACE-FTS O<sub>3</sub> isotopologue data.