

RECENT RESULTS FROM THE ATMOSPHERIC CHEMISTRY EXPERIMENT (ACE)

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SCISAT-1, otherwise known as the Atmospheric Chemistry Experiment (ACE), is a Canadian-led satellite mission for remote sensing of the Earth's atmosphere, launched August 2003. The instruments on the small science satellite employ solar occultation to measure profiles as a function of altitude for pressure, temperature, aerosols, and dozens of molecules of atmospheric interest. The primary instrument is a custom Fourier transform spectrometer featuring high resolution (± 25 cm maximum optical path difference, for a resolution of 0.02 cm^{-1}) and broad spectral coverage in the infrared (750 - 4400 cm^{-1}). An overview of the mission will be presented, along with highlights of recent observations and results. This will include atmospheric Cl and F inventories derived from ACE measurements, studies of O₃ loss during polar spring, Cl partitioning during the polar winter and spring, enhanced NO_x during polar spring, biomass burning, polar mesospheric clouds, and HNO₃ from lightning. Global distribution studies will be described for CH₃OH and COCl₂. Results from recent validation studies will be presented, particularly for temperature and O₃. Deviations of H₂O lines in the ACE spectra from the traditional Voigt line shape will be described, along with an analytical form for calculating the speed-dependent Voigt line shape. A preview of the next processing version for ACE will be provided.