INITIAL STUDIES OF TEMPERATURE RETRIEVALS FOR THE ATMOSPHERIC CHEMISTRY EXPERIMENT (ACE)

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SciSat-1, otherwise known as the Atmospheric Chemistry Experiment (ACE), is a Canadian satellite mission for remote sensing of the Earth's atmosphere. It was launched into low Earth orbit (altitude 650 km, inclination 74°) in August 2003. The primary instrument onboard ACE is a high resolution (maximum path difference $\pm$ 25 cm) Fourier Transform Spectrometer (FTS) operating from 2.4 to 13.3 microns (750-4100 cm^{-1}). The satellite also features a dual spectrograph known as MAESTRO with wavelength coverage 280-1000 nm and resolution 1-2 nm. A pair of filtered CMOS detector arrays takes images of the sun at 0.525 and 1.02 nm. Working primarily in solar occultation, the satellite will provide altitude profile information for temperature, pressure, and the volume mixing ratios for several dozen molecules of atmospheric interest. Scientific goals for ACE include: (1) understanding the chemical and dynamical processes that control the distribution of ozone in the stratosphere and upper troposphere; (2) exploring the relationship between atmospheric chemistry and climate change; (3) studying the effects of biomass burning in the free troposphere; and (4) measuring aerosols to reduce the uncertainties in their effects on the global energy balance. The presentation will include a discussion of the ACE data quality, a description of retrieval algorithms used for determining pressure and temperature from the FTS measurements, and examples of preliminary analysis results. Retrieved temperatures will be compared to correlative data from the Canadian Meteorological Centre.