THE ATMOSPHERIC CHEMISTRY EXPERIMENT (ACE)

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The principle goal of the ACE mission is to investigate the chemical and dynamical processes that govern the distribution of ozone in the stratosphere and upper troposphere. The ACE satellite is a high-resolution (0.02 cm^{-1}) infrared Fourier Transform Spectrometer (FTS) operating between 2 and 13 microns that is capable of measuring the vertical distribution of gases with better than 4 km vertical resolution from the cloud tops (boundary layer) to approximately 100 km. A comprehensive set of simultaneous measurements of the vertical profile for trace gases, aerosols, temperature and pressure will be made using solar occultation from a low Earth orbit (650 km). Aerosols and clouds (i.e. PSCs) will be monitored using the extinction of solar radiation at 0.525 and 1.02 microns as measured by two filtered CCD arrays as well as by their infrared spectra. The combination of the visible and near-IR channels along with the broad wavelength range of the FTS will permit information on composition and size to be extracted for PSCs and other aerosols. Although the satellite coverage will include tropical and mid-latitudes, its orbit has been optimized for maximal coverage of the Arctic winter and early spring.
ACE has just been selected in the Canadian Space Agency's SCISAT-1 program for a planned launch by NASA in the year 2001.