Infrared Earthlimb and Terrestrial Backgrounds

**MSX Instrumentation**

SPIRIT III and UVISI

**Objectives**

Atmospheric background measurements will be collected as a function of altitude, latitude, season, and atmospheric conditions. These experiments will examine backgrounds over an extended wavelength region (ultraviolet to very-long-wavelength infrared) with high spectral and spatial resolution. The goal is to bound the range of spectral content and small-scale spatial irregularities of earthlimb infrared backgrounds and to determine their global distributions, associations with specific phenomena, and frequencies of occurrence. Earthlimb and terrestrial background experiments will measure the radiance and structure from nadir to full-limb viewing geometries at altitudes up to 300 km. The atmospheric phenomena to be measured include aurora, airglow, mesospheric clouds, noctilucent clouds, joule-heated atmospheres, and stratospheric warmings. The experiments will be performed repetitively as a function of geographic, geomagnetic, and seasonal parameters. They will provide a comprehensive examination of the atmosphere for the development and extension of atmospheric models of infrared radiance and structure.

**Description**

The background measurements will be acquired in periods of approximately 20 minutes each throughout the mission. The number of observations per day may range from a single observation recording data at 25 Mbps to eight observations recording data at 5 Mbps. The mission timeline is being designed for flexibility to observe transient geophysical

Simulated measurement capability of the SPIRIT III interferometer.
Environmental Observations

Ultraviolet, visible, and infrared emissions will be evaluated for key trace constituents to provide a data base fundamental to understanding climate change. Earthlimb observations include an experiment to measure chlorofluorocarbons and nitric acid. The 10.6- to 13-μm band of the interferometer will obtain data in the altitude range from 10 to 40 km. Dominant emissions in this band include nitric acid, CFC compounds, ozone, and the thermal signature of stratospheric aerosols. The data obtained will help determine the latitude and seasonal variability of species significant to ozone depletion in the stratosphere. The results will be available to the scientific community for stratospheric chemistry models and other investigations to support studies of ozone depletion.

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