Geophysical Research Abstracts, Vol. 8, 05215, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05215

First light from the Far-Infrared Spectroscopy of the Troposphere (FIRST) Instrument

M. G. Mlynczak (1), D. G. Johnson (1), H. Latvakoski (2), K. Jucks(3), M. Watson (2), D. P. Kratz (1), X. Liu (1), G. Bingham (2), W. Traub (4)

(1) NASA Langley Research Center, Hampton, VA, USA; (2) Space Dynamics Laboratory, Logan, UT, USA; (3) Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA; (4) Jet Propulsion Laboratory, Pasadena, CA. USA.

The Far-Infrared Spectroscopy of the Troposphere (FIRST) instrument successfully completed its technology demonstration flight on June 7 2005 on a high altitude balloon launched from Ft. Sumner, New Mexico. FIRST is a Fourier Transform Spectrometer (FTS) designed to measure the “far-infrared” portion of the emission from the Earth and its atmosphere at wavelengths longer than 15 um. Developed under NASA’s Instrument Incubator Program (IIP) FIRST demonstrated the interferometer, beamsplitter, and focal plane technology necessary to make daily global measurements of the far-infrared in a space-like environment. The FIRST instrument operated from a float altitude of 27 km for over five hours and recorded about 15,000 spectra. The instrument exceeded design specifications and observed essentially the entire thermal infrared spectrum of the Earth between 6 and 120 um at 0.625 wavenumber resolution. Comparisons with the MODIS, CERES, and AIRS instruments that overflew the FIRST payload indicate excellent agreement, implying an excellent calibration of the FIRST instrument. FIRST opens the door to achieving understanding of the role of upper tropospheric water vapor and cirrus clouds on climate, and paves the way for space based measurements of the far-IR.