Validation of Six Years of Mid-Tropospheric CO_2 Data from the Atmospheric Infrared Sounder AIRS

E. Olsen[1], M.T. Chahine[1], L.L. Chen[1], X. Jiang[2], T.S. Pagano[1] and Y.L. Yung[3]

[1]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109; 818-354-4443, E-mail: edward.t.olsen@jpl.nasa.gov
[2]University of Houston, Houston, TX 77204
[3]California Institute of Technology, Pasadena, CA 91125

The retrieved distributions of mid-tropospheric CO_2 from the Atmospheric Infrared Sounder using the Vanishing Partial Derivative algorithm are compared to *in situ* measurements by commercial and research aircraft and to retrievals by land-based upward-looking Fourier Transform Interferometers. Estimates of AIRS CO_2 accuracy depend on the type and proximity of the measurements to the satellite footprint but remain between 1-2 ppm, under clear and cloudy conditions and over both land and oceans, between latitudes 30°S and 80°N. The seasonal phases are captured and the latitude variability in amplitude is validated. Also, the rate of growth of CO_2 over the six-year period is computed between 60°N-60°S latitudes as 2.02±0.08 ppm/year.

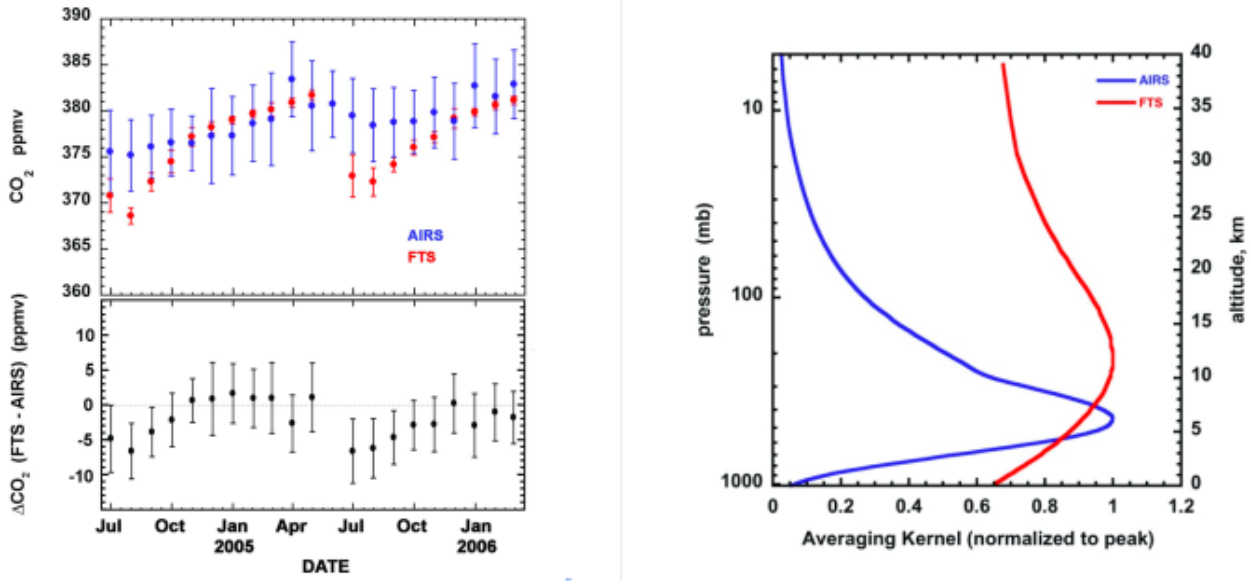

Figure 1. Seasonal variation of monthly average AIRS retrieved CO_2 within 250 km of Park Falls, Wisconsin compared to monthly average Park Falls Fourier Transform Spectrometer measured total column CO_2 and their differences.