

Column CO₂ Estimates at ARM-SGP

M.L. Fischer¹, D. Wunsch², S. Biraud¹, J.L. Blavier³, N. Honsowetz², G. Keppel-Aleks², C.E. Miller³, C.M. Roehl², C. Sweeney⁴, J. Smith⁵, G.C. Toon³, M.S. Torn¹ and P.O. Wennberg²

¹Lawrence Berkeley National Laboratory, MS 90K-125, 1 Cyclotron Rd., Berkeley, CA 94720; 510-486-5539, E-mail: mlfischer@lbl.gov

²California Institute of Technology, Pasadena, CA 91125

³Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109

⁴NOAA Earth Systems Research Laboratory, Boulder, CO 80305

⁵Atmospheric Observing Systems, Boulder, CO 80301

We report on column CO₂ estimates from the ARM Climate Research Facility in the Southern Great Plains (36.6053° N, 97.4891° W, near Lamont, Oklahoma). Data include multi-year variations in midday near-surface (60 m) CO₂ mixing ratios, a multi-year record of periodic CO₂ profiles (to ~ 5 km) from a small aircraft, and initial column CO₂ retrievals made with a Fourier transform spectrometers (FTS) deployed at the SGP site. Using *in situ* CO₂ mixing ratio measurements, we estimate column CO₂ over time and compare with the FTS retrievals. We also evaluate the temporal variations in estimated column CO₂ at SGP as well as the relative contributions to variation with altitude along the vertical profile. These results provide an initial evaluation of the FTS retrievals at ARM-SGP in preparation for comparisons with future validation of GOSAT.

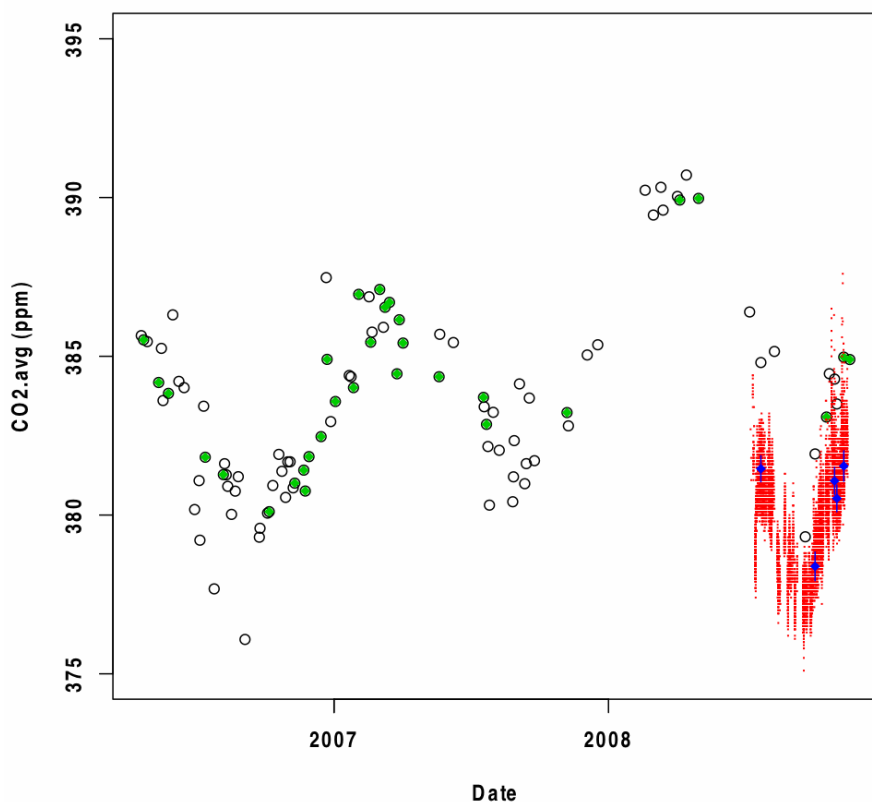


Figure 1. Column average CO₂ mixing ratio from the combination tower and airborne flask measurements (0.3 to ~ 5 km) for morning (open circles) and afternoon (green circles) samples, full column estimates from a Fourier transform spectrometer for all retrievals (red) and averaged into 1 hr bins surrounding airborne measurements (blue).