Using Tropospheric Emission Spectrometer CO_2 Observations for Inverse Modeling Estimates of Carbon Fluxes

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We present carbon dioxide estimates and characterization from the Tropospheric Emission Spectrometer (TES) aboard the NASA Aura spacecraft, launched in 2004, with comparisons to aircraft and surface *in situ* data. TES CO_2 is sensitive between about 200 and 800 hPa, with peak sensitivity in the mid-troposphere (511 hPa) and ~1.5 ppm accuracy for regional monthly averages. We compute terrestrial and ocean flux estimates with TES data and the GEOS-Chem chemical transport model, using a Bayesian inversion approach, and find that TES satellite observations of CO_2 provide important constraints on flux estimates, particularly in the tropics.

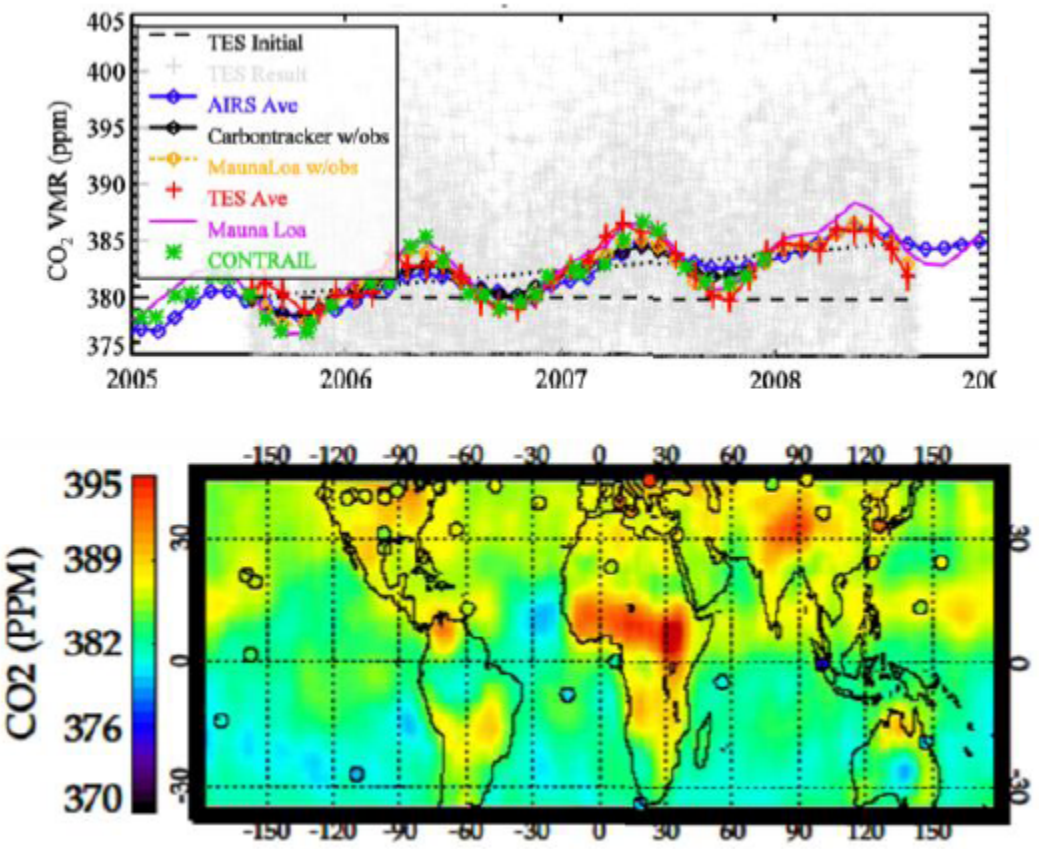

Figure 1. TES comparison to validation data and versus GLOBALVIEW (circles) for March – May, 2006-2007. TES data monthly averaged over 15x15 degrees shows similar patterns to surface data and has about 1.5 ppm error.