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Atmospheric Chemistry and Physics Discussions

Interactive comment on "First carbon dioxide atmospheric vertical profiles retrieved from space observation using ACE-FTS solar occultation instrument" *by* P. Y. Foucher et al.

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Congratulations on the new ACE CO2 product!

I am very interested in the seasonal patterns for 10-18 km shown in figure 6. It would be very valuable to TES and other CO2 products to have a characterization of the values and variability with respect to altitude and latitude which then can be used to better estimate CO2 and errors from levels where we do not have complete sensitivity.

I was surprised that the ACE pattern from 10-12 km was significantly different from the pattern at 9-10 km because I don't see comparable systematic differences when I look at CONTRAIL for altitude altitude > 11 km and compare to Mauna Loa (3.5 km). It

looks like you used the ACE 9-10 km for comparisons to CARIBIC but did not compare the ACE 10-12 km results to CARIBIC or CONTRAIL. The mean CONTRAIL altitude is about 10.7 km and the CARIBIC data has a mean pressure of 240 hPa, about 10 km. It seems like the 10-12 km ACE result could also be validated with aircraft data.

TES also recently developed a CO2 product between 40S and 45N with peak sensitivity at 500 hPa, if you could add this in the introduction where you discuss other satellite CO2 products. Here is the citation: Kulawik, S. S., Jones, D. B. A., Nassar, R., Irion, F. W., Worden, J. R., Bowman, K. W., Machida, T., Matsueda, H., Sawa, Y., Biraud, S. C., Fischer, M. L. and Jacobson, A. R.. Characterization of Tropospheric Emission Spectrometer (TES) CO2 for carbon cycle science, Atmospheric Chemistry and Physics, 10, (12), 5601-5623, 2010.

Sincerely, Susan Kulawik

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 26473, 2010.