

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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Received and published: 11 January 2011

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

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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.

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