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Atmospheric Measurement Techniques Discussions

Interactive comment on "A simple empirical model estimating atmospheric CO_2 background concentrations" *by* M. Reuter et al.

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Dear authors,

Your study presents a simple model to describe column average dry-air mole fractions of atmospheric CO2 and mixing ratio profiles. Although your product is tailored to satellite retrieval applications and has a different scope than previous empirical descriptions of the global CO2 distribution, it is necessary to properly reference these previous works, to put your study into perspective and to explain what the added value of your empirical model is.

Describing the global CO2 distribution and its evolution with time through curve fitting/regression has a long tradition in the in-situ measurement community. For single

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stations, the temporal evolution has been described by a superposition of a trend component and a series of harmonic terms similar to your approach already by Keeling et al. (1976) and later by others. The global distribution of CO2 derived from the NOAA GMCC flask sampling program (as it was called back then) including its latitudinal distribution and temporal evolution has been described for example by Komhyr et al. (1985). Particularly relevant in the context of your study is the work of Masarie and Tans (1995) describing the GLOBALVIEW product of NOAA.

Suggested references:

Keeling, C. D., R. B. Bacastow, A. E. Bainbridge, C. A. Ekdahl, P. R. Guenther, L. S. Waterman, and J. F. S. Chin, Atmospheric carbon dioxide variations at Mauna Loa Observatory, Hawaii, Tellus, 28, 538-551, 1976.

Komhyr, W. D., R. H. Gammon, T. B. Harris, L. S. Waterman, T. J. Conway, W. R. Taylor, and K. W. Thoning (1985), Global Atmospheric CO2 Distribution and Variations From 1968–1982 NOAA/GMCC CO2 Flask Sample Data, J. Geophys. Res., 90(D3), 5567–5596, doi:10.1029/JD090iD03p05567.

Masarie, K. A., and P. P. Tans (1995), Extension and integration of atmospheric carbon dioxide data into a globally consistent measurement record, J. Geophys. Res., 100(D6), 11,593–11,610, doi:10.1029/95JD00859.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 1293, 2012.