

Interactive comment on “Measurements of Pollution In The Troposphere (MOPITT) validation through 2006” by L. K. Emmons et al.

Anonymous Referee #1

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This paper updates MOPITT CO validations with the latest in situ profiles and presents their discovery of an increased bias in MOPITT v3 products in the last 3-4 years. MOPITT CO products have been accepted by the community as a source of reference for data assimilation in the Chemical Transport Models (CTMs), validation for the CTMs, the inter-comparison with other CO sensors, and science studies. It is very important to document any updated validation and any changes in data trends in the form of publications. This paper address relevant scientific questions within the scope of ACP and it is well written and well structured. I recommend publication of this paper on ACP after revisions related to the following suggestions.

The discussion of the possible causes of bias could have been more thorough by providing additional information that supports the qualitative discussions. For example, in

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session "4 Possible causes of bias and changes in bias, the authors state that "Analysis of temperature and pressure engineering data indicates that in both cases, the pressure loss is at least partially a consequence of a slow leak, or possibly adsorption of the gas to the cell walls This leads to a negative bias in the Level 1 radiances for the CO-sensitive D signals. Because increasing atmospheric CO concentrations also tend to decrease the CO-sensitive D signals, this instrumental bias will be transformed by the retrieval algorithm into a positive bias in retrieved CO concentrations." This finding of the paper would be more substantiated and clearer for the readers if the stated temperature and pressure engineering data and the Level 1 radiances for the CO-sensitive D signals were presented in some form.

Similarly, the systematic drift in ancillary datasets used in the retrievals should be summarized in this paper, since it is a strong component that can easily affect the retrievals. For example, the retrieval sensitivities for the thermal channels are affected by the temperature contrasts near the surface, and this may be a strong source of bias if the NCEP temperatures have changed systematically.

The following are a couple of other very minor suggestions. In Figure 2, the lower left panel shows the MOPITT vs. aircraft total column correlation, but the bias on the figure has a unit of ppbv. I would also like to suggest that, in Table 2, the NOAA and Campaign data to be summarized in separate columns so that the different focuses between 2004 and 2006 campaigns reflected in the in situ data are viewed independently from the NOAA data, which should offer more consistency with time.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 18091, 2008.

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