

Anonymous review of

Transpacific pollution transport during INTEX-B: spring 2006 in context to previous years”
by G. G. Pfister et al.

This is a very good and thorough assessment of the interannual variability of CO above the Pacific Ocean and the USA. In general I think the paper could be published after a minor revision, but I have one major reservation regarding model verification that needs to be addressed, as follows:

Monthly average model output is compared to monthly average MOPITT retrievals above the North Pacific and the USA and the correlations have high r-squared values, and the model has a slight high bias (although not statistically significant). While this result is encouraging the model and MOPITT may agree for the reasons that are not necessarily correct. The model averages are for all conditions, while the MOPITT retrievals are only valid for clear-sky conditions. We know from studies like Crawford et al. [2003] that Asian CO export is often associated with cloudy conditions, consistent with the concept of Asian export in warm conveyor belts that traverse the Pacific and reach the USA. So it seems likely that MOPITT misses the detection of many strong Asian pollution export events and the CO retrievals are likely to be biased low.

I would like to see a comparison between MOZART and monthly average CO at Mauna Loa, Cheeka Peak and Mt. Bachelor. This comparison would give a better indication if the model is biased high or low and would also show if the model provides an adequate quantification of interannual CO variability in the lower troposphere.

Crawford J, Olson J, Davis D, et al., Clouds and trace gas distributions during TRACE-P, JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES Volume: 108 Issue: D21 Article Number: 8818 Published: NOV 4 2003

Minor comments:

The current title gives the impression that the study is mainly focused on the INTEX-B mission. Readers who are not specifically interested in INTEX-B may overlook this paper based on the title. I think the title would give a better reflection of the contents of the analysis, and would also appeal to a broader audience if it were modified to:

Variability of springtime transpacific pollution transport during 2000-2006: The INTEX-B mission in context to previous years.

page 17819 line 4-6

These lines mention the importance of transport between Asia and North America and how increasing Asian emissions might offset emission controls in the US. These issues

are supposedly supported by Park et al., 2005. However, this paper does not discuss transpacific transport, nor does it discuss Asian emissions offsetting North America emissions. This reference needs to be removed and a more relevant reference needs to be used such as:

Jacob D. J., J. A. Logan, and P. P. Murti, Effect of rising Asian emissions on surface ozone in the United States, *Geophys. Res. Lett.*, 26, 2175-2178 (1999).

page 17825 line 8

r is the correlation coefficient. r-squared is the square of the correlation coefficient, also known as the coefficient of determination.

page 17828 line 21

“and about 1/3 of that found for US”

Shouldn't this be 2/3?

page 17829 line 8

Here you state that BB tracer is about 10% of the CO budget, but from Table 1 it appears that the BB tracer is closer to 20%.

page 17830 line 18

I don't like the term: “natural” variability. It would be better to be more specific and say, meteorological variability.

page 17830 lines 24-25

Please clearly state just the trend in MOZConst. Is it $0.31 \pm .1$ Tg yr⁻¹?

page 17833 lines 5-6

would sound better as:

terms are seen for the CO-CHEM contribution, which due to the high latitude, is up to 6% smaller....

Figure 1

The MOZART data are difficult to see in my printed version. Please use color.

Figure 2

The panels are too small, please enlarge.

Also, does white mean very low CO or missing data? It would be helpful if missing data were shaded gray.

Figure 4

I find this figure difficult to interpret. Please provide additional explanation.

Figure 3

In my printed version I can barely, if at all, see the MozConst values. Please sue color.

Also, in the caption, should convoluted be convolved?

Figure 5

In my printed version I can barely, if at all, see the MozConst values. Please sue color.

Figure g

The gray bars are hard to see, please use color.

Figure 7

Please enlarge by 20%, the text is difficult to read.

Figure 8

The panels are very small and hard to see, please increase by a factor of 2.