

## ***Interactive comment on “Atmospheric column-averaged mole fractions of carbon dioxide at 53 aircraft measurement sites” by Y. Miyamoto et al.***

### **Anonymous Referee #1**

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Review of “Atmospheric column-averaged mole fraction of carbon dioxide at 53 aircraft sites” by Miyamoto et al.

Miyamoto et al describe the integration of numerous aircraft profiles of CO<sub>2</sub> along with estimates of CO<sub>2</sub> above the aircraft ceiling to estimate XCO<sub>2</sub>. Such a catalog of XCO<sub>2</sub> estimates is useful for evaluating XCO<sub>2</sub> data from GOSAT and SCIAMACHY.

I recommend publication of this study after the following additional scope is considered.

1. The age-of-air method for estimating stratospheric CO<sub>2</sub> should be more fully evaluated. Numerous profiles of HF, N<sub>2</sub>O, etc are publically available from ACE-FTS for example that could provide a method for evaluating this approach beyond the few

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SF<sub>6</sub> profiles described. In addition, XHF measurements are publically available from NDAAC and TCCON that could be used to evaluate the approach. 2. Given that several of the aircraft sites have co-located TCCON instruments, a comparison of the XCO<sub>2</sub> presented in this study should be undertaken. 3. Because these profiles and associated estimates of XCO<sub>2</sub> will be broadly useful to the community, I suggest that they be organized and made publically available. A link to such a database would be helpful.

Minor point.

Figure 4 is very difficult to read. I suggest the authors consider showing just a few of these panels (larger format) as examples and put the rest in a supplement or appendix.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 28493, 2012.