Review of "Interpreting the $^{13}C/^{12}C$ ratio of carbon dioxide in an urban airshed in the Yangtze River Delta, China"

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This paper uses continuous measurements of the stable isotopic composition of carbon ($\delta^{13}C$) in CO_2 to investigate CO_2 emissions in the city of Nanjing and the surrounding areas, taking advantage of differing footprints for night (Nanjing) and day (surrounding area) times of day. The most important observation is that some of the $\delta^{13}C$ values are higher than background. The only mechanism to produce this is by incorporating emissions from cement production, which is characterized by very high $\delta^{13}C$ values of +0.20 ‰.

The major concern in this paper is that the authors are using the Miller-Tans (2003) approach to determine the average monthly $\delta^{13}C$ of the sources for daytime and nighttime. In that formulation, the background values of CO_2 mole fractions and $\delta^{13}C$ are included in the linear equation, with the slope being the $\delta^{13}C$ of the high-CO_2 endmember. The equation for this analysis is:
$$\delta_{obs}C_{obs} - \delta_{bg}C_{bg} = \delta_s(C_{obs} - C_{bg})$$

where $\delta_{obs}C_{obs} - \delta_{bg}C_{bg}$ is plotted against $(C_{obs} - C_{bg})$. There should be no intercept determined during the analysis. However, the plots shown in Figures 4 and 5 show significant non-zero intercepts. I have looked at the data from the supplement, together with the NOAA data from WLG, which is being used as background in this new version, and found that the intercepts for the nighttime data for 2013-2014 should be ~-12‰ with a zero intercept, instead of -24 ‰ as shown in Figure 5. My analysis was approximate, in that I used a smoothing spline for interpolating the WLG data, instead of the Thoning et al. (1989) smoothing code. However, these are very different values and should affect the fluxes being calculated. At minimum, the meaning of the intercept values should be discussed, as well as why it is calculated.

Specific comments:
Line 35 and often throughout: Give uncertainties or standard deviations of ranges.

Line 120: After "(Miller et al. 2003)" add "and was used in an urban environment by Newman et al. (2016)."

Line 121: Insert "continuous measurements in" between "to" and "an urban environment."

Line 138: You have justified using the Miller-Tans method earlier in the Introduction. There is no reason to discuss the performance of the Keeling plot method. Also, you do not show any Keeling plots. This discussion is left over from the previous version of the manuscript.

Lines 160 – 162: The carbon isotopic compositions of the two standards (Table 1) are very similar and very far from the values of the ambient measurements. Can you show that there are no extrapolation uncertainties?

Lines 287 – 289: What does it mean to say that $\delta^{13}C$ values display a larger seasonal cycle than do CO_2 mole fraction values? The latter is ~20 ppm, whereas the former ~2‰. Are you thinking about a relative fraction?

Lines 299 – 321: The Miller-Tans (2003) method assumes a zero intercept. What is the meaning of your intercept, and how does it affect the interpretation of the slope?

Lines 218 – 321: What is the significance of these observations? Are they important enough that you should show figure(s) with the correlations?

Lines 348 – 355: A lot of values are given – what are the uncertainties?

Lines 369 – 370: Replace with: "to 2013, which was consistent with the seasonal variation of background and transport of emissions from fossil fuel combustion (Newman et al. 2016)."

Line 418: "Park Falls"

Line 420: "fossil fuel combustion which has low ^{13}C contents." This depends on the nature of the fossil fuel component. As shown in Table 2, gasoline combustion produces CO_2 with $\delta^{13}C$ very similar to the biosphere, and combustion of coal produces CO_2 with values higher than the biosphere.

Lines 477 – 504: Remove this section. It is left over from the previous version and no longer necessary.