Comments on “An improved method for atmospheric 14CO measurements” by Petrenko et al.

General comments:

This manuscript describes an improved method for the collection of atmospheric samples used for the determination of ^{14}CO concentration, which serves as a useful tracer in characterizing the variability of atmospheric hydroxyl radical concentration. Since CO is present only in trace quantities in atmospheric samples, isotopic measurements, especially ^{14}CO measurements demand collection of larger air samples in order to enable measurements with acceptable uncertainties. Such large volume samplings can be both logistically challenging and expensive. Further, performing radiocarbon measurements on small samples (10-50 µgC) poses additional challenge both during graphitization and measurement. Through the methods described in this manuscript, following solutions have been presented: 1) use of a logistically attractive sample volume, 2) amplifying the mass of carbon present in the sample through dilution with high CO containing air to enable more precise measurements than possible in earlier work and 3) demonstrates the importance and the need of procedural blank sampling together with the actual sample collection.

The manuscript is very well written and falls within the scope of the journal AMT. I would recommend this manuscript for publication with some very minor clarifications.

Specific comments:

1. Page 6 Line 167: What pressures do you use during the “pressure-flush” step?

2. Page 6 Line 181: The use of italicized Latin forms should be consistent throughout the manuscript (see page 5 line 138).

3. Page 7 Line 196: Please specify the amount of gas used up during the CRDS measurement.

4. Page 7 Line 197: Was this ^{14}C-depleted high CO-in-air prepared in-house or purchased through a commercial vendor?

5. Page 7 Line 218: Please provide a part number/manufacturers details if purchased through a commercial vendor.

6. Page 11 Line 326-331: What part of this variability that you observe in your procedural blank could be due to memory from the canister itself? Do you clean the canisters in a special way and perform some sort of possible outgassing test? Could you please comment on this?

7. Figure 2: In a plot that covers a large dynamic range, it is common to display a residual to the fit which makes visualization of the distribution of your dataset around the fit very easy. Could you please include this?

8. Figure 3: If one looks at your data carefully, there is a noticeable correlation (although weak) between the ^{14}CO content measured in the blanks vs. the blank-corrected samples collected on the same day. Could you please comment on why this is the case?