

This paper is a very interesting paper that can contribute to the scope of ACP. The results are well discussed and well presented.

Objectives of this paper study are to apportion sources of carbonaceous aerosols on 16 Swiss sites (Traffic, Urban background, Rural background) in the North and South of the Alps during winter-smog episodes for 5 winters (24-hours sampling, about 5 samples per winter per site between 2007 and 2012). Source apportionment is based on ^{14}C measurements realized on Elemental and Organic Carbon separately.

However, before the publication, authors must be more define or must make some corrections or provide additional information on these different points:

1. Title: the time period reported is 2008-2012 since in the text, sampling seems to be performed also during the winter 2007-2008. Are no samples from December 2007 taken into account?
2. Materials and methods/Aerosol sampling: dates of sampling are not reported in the paper. Could you input in this part?
3. Materials and methods/2.3.2: this part on data correction is very complex, it is difficult to well understand, notably due to the use of many subscript notations like " $f_{\text{M,EC,final}}$ ". This part must be more readable. And page 15604, line 11, is not " $f_{\text{NF,ref}}$ " instead of " $f_{\text{N,ref}}$ "?
4. Materials and methods/2.5: how was PM10 mass measured on the different sites: with TEOM? Equipped with a FDMS system? On which sites PM10 mass was measured gravimetrically?
5. Results and discussion/3.1: page 15609 line 7: input a "in" before Zotter et al.
6. Results and discussion/3.2.2: page 15613 line 23: what is "IQRs"?
7. Results and discussion/3.3.2: in this part and in the Table 3 EC/Levo, OC/Levo, OC/EC and Levo/ K^+ are reported: have you compare your values with those from Herich et al., 2014 in winter? Or with values from Gianini et al. 2013 (ref: Sci.Tot.Environ. 454-455, 99-108), that reported OCWB/Levo from PMF and CMB estimations in the same Swiss sites (ZUR, BERN, MAG, PAY)? Could you more compare your ratios with those from these papers in the part 3.3.3 and discuss about differences? Particularly differences between ^{14}C measurements and PMF or aethalometer models estimations conducted on Swiss sites.
8. Conclusions:
You say page 15621 line 1 "wood burning can be the dominating source of carbonaceous aerosols during the cold season, in Europe" and during winter-smog episodes. But it is for just the carbonaceous fraction of aerosols. What is the contribution of wood burning to PM10 during these winter-smog episodes? Is the contribution higher or lower than those from Secondary Inorganic Aerosols?
On the same page, you write "no correlation was observed between fossil OC and fossil EC and NO_x , indicating that a considerable amount of OC_F is secondary OC (SOC) formed from fossil precursors emitted from traffic". Why it could be SOC from traffic since it was no correlated with EC_F or NO_x ? OC_F could maybe be formed from precursors emitted by other fossil sources like combustion of fossil energy for domestic heating or in the industry? Can the non-correlation between OC_F and EC_F and NO_x due to an analytical error on the OC_F measurement, particularly is the correction of the charring well adapted?
9. General comment on the figures: Figures 3, 5, 6 and 8 are so small and it is difficult to read some characters. Could you change character and figures sizes please?