

March 31<sup>st</sup> 2012

### **General comment :**

This paper is very interesting since it is one of the first instances of comparison of AMS data with GC-MS data obtained with short sampling time. The comparison is also for an extensive period of time. This overall comparison is rather well presented and extensive. The figures are clear. The English could be improved in many instances. The main drawback is about the conclusions. I believe that they could be more substantiated and made very clear. By the end, the answers are needed for the questions “Can the AMS provide a quantitative measurement of the WC fraction, and if yes, with what uncertainties?”. The discussion can certainly be extended and focused with the data in hand, on that should appear first in the conclusion section, and be synthesized in the abstract.

### **Specific comments**

#### **p 4834**

line 2 : no point after health

lines 15 – 18 : the sentence is awkward

line 26 : “... source apportionment **for WC...**”

lines 27 – 28 : “... on the measurements performed in Ausbourg using an AMS ...

#### **p 4835**

line 6 : function = potential ??

line 13 : “... wood burning results obtained with these methods”

line 14 : “In this work, the concurrent filter ...”

lines 24 – 25 : strange sentence

line 26 : “... in other papers...”

#### **p 4836**

Line 6 : what are the uncertainties associated with the value of 0.5 ?

Line 23 : no comma after “Both...”

#### **p 4838**

line 20 : add a comma after “desorption”

#### **p 4840**

lines 10 – 11 : the measurements of the sizes are that precise, that you can give it with 2 digits ?

#### **p 4841**

lines 13 – 14 : why is it surprising ? These secondary products could come from heterogeneous reactions in the liquid phase of fog, for example.

#### **p 4842**

line 7 : is given = is obtained ?

lines 9 - 10 : “... City of Grenoble has a population size like that of ...”

lines 10 - 12 : so what ? is it significant or not ? what is the number of points for these correlations ?

line 16 : “ ..... solution, HOA.....”

line 19 : “..... contributions .... are ....”

line 23 : “Hence, ....

line 25 : 20 % of contribution of WC to OC on a daily average for the whole period.. How come that there is no fluctuation with daily mean temperatures that are really variable ?

#### **p 4843**

line 5 : pb in the sentence

line 8 : Due to this, ...”

lines 18-28 : all of this section is hardly understandable, because of too long and intricated sentences, because the meaning of “course” (lines 20 and 23) is not defined, and because the ideas that are to be demonstrated are not clear. These lines should be rewritten completely.

#### **p 4844**

line 1 : “...between the concentrations of the source related species....”

lines 7-8 : this sentence is too general ; BC is not always and everywhere attributed to traffic.

Lines 9 and 10 : you should comment on this result : how come that the AMs results (for PM1) are better correlated with PM2,5 filters than PM1 filters ?

Lines 15-22 : this method for the calculation of an equivalent levoglucosan concentration needs more explanations for at least 2 points. i) What is considered as the “organic background” is not clear. ii) it seems that an implicit hypothesis is that there is no other species contributing to the m/z 60 ? What are the consequences (in term of uncertainties of the recalculated concentrations) of these 2 hypotheses ?

#### **p 4845**

Line 21 : as opposed to what is described in the text, figure 6 indicates only a very limited increase during mid-day (10h00 to 12h00), that should on top of it be within the uncertainties of the determinations.

Lines 22-25 : this hypothesis could be checked to some extent with the measurement of the global radiation.

#### **p 4846**

line 12 : is this coherent ? where / when was the study by Lanz et al ?

lines 17-18 : “ .... That the fuel type used has ....”

Line 25 : “ .... in the french city of Grenoble, and higher than the results obtained in Beijing (reference ?), where ....”

#### **p 4847**

line 5 : how can you say that m/z 60 is mainly coming from levoglucosan ? the isomers of levoglucosan are not leading to m/z 60, for example ?

line 7 : where / when were these other campaigns ?

line 15 : well, this is the opposite of line 5 on the same page !!

lines 22-23 : could you explain what is this expression, and why it could be more suitable ?

#### **p4848 :**

line 4 : where did you showed that ?

lines 5-7 : this sentence is not precise enough : what is this important role, and why is it important in the context of the study ?

lines 9-11 : why should the cooking source be in the substrated background, and not a source factor by itself ?

line 11 : there should be a synthesis of your arguments at the end of this section, in order to clearly understand what is your point and what is the conclusion of this discussion.

line 15 : what means “course” in this context ? (and all over the text)

lines 12 – 20 : since you have not been clear on what is the “organic background” (re, comment for page 4844), it is difficult to understand what you intent to do in all of this section

lines 21-25 : you have to discuss about the slope (7,01) between the two indicators, as compared to the ratio (organic matter / levoglucosan) proposed in the litterature (cf table 1)

Lines 25-26 : you introduce here the notion of “AMS anhydrosugar equivalent”. Is it the same as “AMS levoglucosan equivalent” introduced page 4847, line 11 ?

Lines 25-29 : this seems to be the conclusion of the overall section 3.4, and therefore should stand as a paragraph by its own. However, this conclusion should be very carefully worded.

First, I do not believe that the point in the second sentence proves much, since these two indicators are constructed on the same measurements (ie m/z 60), that has been shown in the previous sections not to be completely representative of the levoglucosan (or the anyhosugars in general). Therefore it should not be presented as a conclusion of the section. The first sentence is more interesting and really synthetize this section. However, it would requires further associated comments on the words “suitable” and “qualitative”.

#### **Page 4849**

lines 10-12 and line 14-15 : poor english

lines 23-24 : poor english

line 25 -26 : I do not see where this has been done in the paper.

Also, see comments below for the abstract.

#### **Abstract**

Line 10 : “During the measurement period ....”

Lines 10-11 : “organics” : are you talking about OC or OM ?

Lines 22 - 27 : This is the main conclusions of the paper and what most of the readers will retain. Therefore it should be made very clear. What mean “suitable” and “description” ? By the end, the answers are needed for “Can the AMS provide a quantitative measurement of the WC fraction, and if yes, with what uncertainties ?”. The discussion on that should appear first in the conclusion section, and be synthetized in the abstract.