We thank an anonymous referee for his/her fruitful suggestions. We have revised our paper entitled "Annual variations of carbonaceous $PM_{2.5}$ in Malaysia: influence by Indonesian peatland fires" according to the comments of the reviewer 4.

Our responses to the reviewer's reports are as follows:

1) On the application of OP/OC4 index.

It seems that OP/OC4 is the most reliable index for identifying IPF in the results. Is the index specific for IPF, or it is also applicable to distinguish biomass burning from other PM sources (such as biogenic and fossil fuel emissions)? It would be quite interesting to the readers if the authors could provide more information/discussions.

In the Experimental method section, more details on how the OC components were determined, and what is the difference between OP and OC4 could be provided.

We consider that OP/OC4 is not applicable to distinguish biomass burning except for IPF from other PM sources "at least in Malaysia" based on the results shown in Figure 7.

✧ We replaced "A detailed description of the quantification method has been provided elsewhere (Fujii et al., 2014)." (Page 22423, Lines 20–21) by

"As shown in our former report (Fujii et al., 2014), the IMPROVE_A temperature protocol defines temperature plateaus for thermally-derived carbon fractions as follows: 140 °C for OC1, 280 °C for OC2, 480 °C for OC3 and 580 °C for OC4 in helium (He) carrier gas; 580 °C for EC1, 740 °C for EC2 and 840 °C for EC3 in a mixture of 98% He and 2% oxygen (O_2) carrier gas. OC and EC are calculated from the eight carbon fractions as follows:

$$\mathrm{OC} = \mathrm{OC1} + \mathrm{OC2} + \mathrm{OC3} + \mathrm{OC4} + \mathrm{OP}, \quad (1)$$

$$\mathrm{EC} = \mathrm{EC1} + \mathrm{EC2} + \mathrm{EC3} - \mathrm{OP}, \quad (2)$$

where OP is defined as the carbon content measured after the introduction of O_2 until reflectance returns to its initial value at the start of analysis.".

2) On the source apportionment.

The authors used two datasets, the whole samples (PJ_A) and those excluded typical biomass burning days (PJ_S). The initiative to conducting such separating analysis could be provided. As well, the resulting differences in the PM sources between using these two datasets could be discussed, which may provide information about the PM sources to the site with and without influences of biomass burning/IPF.

- ✧ We replaced "all samples except for those acquired on September 2011 and June 2012" (Page 22424, Line 28–Page 22425, Line 1) by "excluded are the samples acquired on September 2011 and June 2012, which are influenced by IPFs as shown in the Section 3".

- ✧ We added "PCA results with these datasets are expected to show definite presence of IPF as a source and its effect on the extraction of other sources." before "It has been suggested that the minimum number of samples (*n*) for factor analysis…" (Page 22425, Lines 1–2).

- ✧ We added the sentences "The differences of the factor loadings between PJ_A and PJ_S data are observed. For the PCA result of PJ_A dataset, the factors such as tire wear (factor S1) and cooking (factor S5) as shown in Table 2b are not extracted due to strong influence of IPFs. Although a petrogenic source is identified from both results, C_{25} and C_{26} are not heavily loaded for PJ_A dataset. This is also considered to be due to strong influence of IPFs." before the sentence "Wahid et al. (2013) reported varimax-rotated PCA results on the distribution of inorganic ions within fine-mode aerosols ($<$ 1.5 μm) at Kuala Lumpur, which is close to the present study's sampling site (~ 10 km)." (Page 22432, Line 27–Page 22433, Line 1).

3) On the sources of biomass burning.

The authors focused on the influences of peatland fires on PM in Malaysia. Their results about OC components (Figure 3) and biomass burning tracers (Figure 7) showed similar seasonal trend. They attributed the biomass burning sources mainly to peatland fires. On point the authors are suggested to consider is that there are other biomass burning sources, such as from forest fires/deforestation in the region. As was shown in Figure 7 and in P22431, L25-P22432, L5, the levoglucosan could be originated from other biomass burning sources. How about these other sources? Are they contributing to a large fraction to PM in the South Asia region, or Malaysia?

Other biomass burning sources except for IPF source definitely exist in this study field because we could identify tracers for biomass burning sources such as cellulose and lignin pyrolysis compounds throughout the annual samples. However, in this study, we cannot determine if they contribute to a large fraction of PM in the South Asia region or Malaysia. Other analyses such as Chemical Mass Balance and Positive Matrix Factorization with the dataset of inorganic components are needed.

4) Similar to comment #1, is C27-alkane a specific tracer for IPF, or it is applicable for other biomass burning?

The mass fraction of total *n*-alkanes ($C_{20–33}$) in PM of biomass burning source such as savanna grass or meat cooking is <u>much lower</u> than that of IPF source as reported by Fujii et al. (2015a). Therefore, we consider that C_{27} is not applicable for other biomass burning as a tracer.

[Others]

5) We replaced equation 1 (Page 22425, Line 4) by 3.

6) We replaced equation 2 (Page 22430, Line 13) by 4.

7) We replaced “in review” (Page 22435, Line 32) by “in press”.