Reviewer's report

Title: Assessment of the capacity of vehicle cabin air inlet filters to reduce diesel exhaust-induced symptoms in human volunteers

Version: 3  Date: 21 January 2014

Reviewer: Yiyi Xu

Reviewer's report:

Major Compulsory Revisions

The new generated diesel particles are usually fine particles, like PM2.5 or PM1. Plus, the authors also mentioned that ‘the particle number size distributions in the chamber ranged from 0.014 to 0.660 µm (mobility diameter)’. However, the authors only presented the results of PM10 mass concentration in different exposure scenarios. Thus, the major question is that why the authors chose to present PM10 instead of PM2.5 or PM1. Were number concentration and number size distribution also monitored in different exposure scenarios? Did filters with or without active charcoal have any effect on these two parameters change?

Minor Essential Revisions

1. In the method part of abstract, the author mentioned ‘Respiratory symptoms and lung function were measured pre and immediately post exposure’ which is inconsistent with the description in the main text quoted as ‘the symptoms were assessed by questionnaire before and every 15 minute throughout the duration of the exposure, and the lung function were performed before and one hour after each exposure.’

2. It is not correct to say ‘improve health’ or ‘enhance well-being’ as the effect of the filters (the last sentence of the first paragraph of discussion and Conclusion). The filters are only for protection. Recommend to rephrase into something like 'reduce the adverse health effect of DE'.

3. In the third paragraph of discussion, it was written that ‘Filter A, which was the same filter but without charcoal, was included as reference.’ However, all the comparisons in the paper were only between filtered DE and unfiltered DE. The meaning of having a reference filter A is not clear when there was no comparison between filter A and B.

4. In the fourth paragraph of discussion, the authors wrote as ‘In the present study, the combination filter (B) including active charcoal, …. Both particle number and mass by as much as 75%’. But there is no result about particle number concentration. It would be interesting to include the number concentration changing during different exposures.
5. The statistical analysis was based on delta changes, so it would be clearer to list delta changes in all the tables.

6. In table 2 and table 3, it was not clear that in which two exposures were the analysis performed. This should be explicit.

7. In table 3, what is the unit of each biomarker? How are the data given as?

8. In the 4th paragraph of results part, the detailed description of the influence of symptoms should be given in Figure 3-5 instead of Figure 2-4.

9. Please pay attention on the use of abbreviation of diesel exhaust in the paper. Some place the authors use DE, some not.

Discretionary Revisions
1. Abstract, last line of conclusions, I recommend ‘These data demonstrate the effectiveness of cabin filters on protecting subjects’.
2. Methods, 5th line of exposures, I recommend ‘The exposures were separated by…’
3. Results, 3rd line of 3rd paragraph, I recommend ‘bad taste compare with unfiltered DE’
4. Results, 4th line of paragraph of ‘Systemic markers of inflammation’, it should be ‘of’ instead of ‘if’
5. Results, 9th line of paragraph of ‘In vitro measurements’, I recommend no capital of ‘FILTER’
6. Discussion, 3rd line of 5th paragraph, it should be no parentheses
7. Discussion, penultimate 5th line of 5th paragraph, I recommend no parentheses of filter B
8. Discussion, 4th line of the paragraph before ‘limitation of the study’, I recommend no parentheses of filter B

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests