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Interactive comment on "VOCs emission profiles from rural cooking and heating in Guanzhong Plain, China and its potential effect on regional O_3 and SOA formation" *by* Jian Sun et al.

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This article stated the VOC characters emitted from solid fuel burning and evaluated the influence of the VOCs on ozone and SOA formation to Guanzhong area. It is interesting to know that the called clean stove was not efficiently in reducing VOCs emission. And the VOCs profiles emitted from residential burning of biomass and coal will be useful in many works. But it's better to have data or detail explanations to the following questions:

1. Line 84: Where do you get the semi-gasifier? How many semi-gasifier stoves did you use for sampling? And are there any difference in performance between different

stove? Response: The semi-gasifier was designed by our research group and man-ufactured by the professional stove factory. More than one semi-gasifier stoves were used during sampling and average value was used to avoid the experimental errors.

2. Equation 1: How to confirm the weight of fuels as the combustion is a continuous process. Or the author just uses one run for each test? Please explain. Response: The combustion in real scenario was continuous. We used circulation method to quantify the weight of fuels in combustion. That is, for each cycle, the fuels added into stove was fixed and the duration of each fuel combustion was also fixed. When the circulation was steady, we started the sampling.

3. Line 164-165: Please explain why sufficient air led to higher VOCs emission in open burning. And what is the relationship to this study. Response: It is because for straw open burning with sufficient air supply, the VOCs emission were still high. Therefore, there should be another influencing factor in affecting the VOCs emissions.

4. Section 3.2: CD <0.2 was usually used to as a threshold of similarity. As all the CDs in this study were over 0.2, why the author discussed it so detailed? Response: The discussion of similarity between different VOCs profiles here was to support if it was necessary to treat these profiles separately when conducting source apportionment and database building. Because the profiles were mainly from the same category called residential solid fuel burning. The relatively high CD values supported that it is necessary to consider them as different sub-sources.

5. Line 302: O3 should be O_3 or ozone. Response: Done. And some other similar errors has been corrected in the manuscript.

6. Line 301-309: Uncertainties should also be derived from the weather parameters. Because the temperature and pressure used in model was fixed, but in real world the T, P and concentrations of pollutants were variable with time. So please add this point to the uncertainties analysis. Response: The weather parameters related uncertainties was added into the uncertainty analysis in the manuscript. Adopting the model with

fixed parameter would lead to uncertainties in this study, and more complete model will be employed in future studies.

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