

## ***Interactive comment on “Organic molecular tracers in the atmospheric aerosols from Lumbini, Nepal, in the northern Indo-Gangetic Plain: Influence of biomass burning” by Xin Wan et al.***

**Anonymous Referee #2**

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Wan et al reports a study of organic aerosols in Lumbini, a site of northern Indo-Gangetic Plain (IGP) with the emphases on the influence of biomass burning. They found that organic aerosols in Lumbini was not only related to the local agricultural activities and residential biomass usage, but also impacted by the regional emission. Although some previous work has reported organic aerosols in this region (mostly in India), this study does add valuable knowledge for the scientific community to better understand the abundance, composition and sources of organic aerosols in north IGP. Such information is useful for adapting proper mitigation measures, and thereby reducing the air pollution in South Asia. Generally, this paper is well written and logically ordered. The statement is convincing since it is based on a comprehensive dataset

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and appropriate discussion. Therefore, I recommend this paper to be published after a revision.

Specific comments: 1. The English writing needs to be improved. Some sentences and description are redundant. For example, the sentence of Lines 53-58 is too long, which is hard to follow. 2. Line 177, do you have any idea about the low recovery of malic acid? 3. Line 190.  $K^+$  should be replaced by major ions, because in the following section,  $Ca^{2+}$  and  $Mg^{2+}$  were also included in the IC analysis. 4. Line 200, as stated by the authors, the concentrations of OC, EC and major ions reported in this work were corrected by their field blank values. So, the levels of such constituents in the field blank filters should be presented. 5. Lines 248-259, in general, relatively high OC/EC ratio represents a high contribution of secondary organic aerosol (SOC) as mentioned in many publications. According to your current dataset of OC, EC as well as the tracers, is it possible to estimate the importance of secondary organic aerosols? Considering the emissions and meteorological conditions in this region, SOC maybe also very important, but now little is discussed inside the manuscript. 6. Line 470, due to the low PBL height in the winter, could you provide its average value, instead of the current subjective description? 7. Line 505, clear or clean? 8. I suggested the authors to move the Fig S6, regarding the MODIS image of the regional emission and transport of smoke plume in the fall, to the main text. 9. As highlighted by the authors, the BrC in the organic aerosols deserve more research in the future. Actually, in the paper by Stockwell et al (2016, ACP), some optical properties of BrC in biomass-burning aerosols have already been determined. So, such new progress should be reflected in this manuscript. 10. In Figure 5: Fu et al. (2010) was missed in the Section of References.

Reference: Stockwell, C. E., Christian, T. J., Goetz, J. D., Jayarathne, T., Bhave, P. V., Praveen, P. S., Adhikari, S., Maharjan, R., DeCarlo, P. F., Stone, E. A., Saikawa, E., Blake, D. R., Simpson, I. J., Yokelson, R. J., and Panday, A. K.: Nepal Ambient Monitoring and Source Testing Experiment (NAMaSTE): emissions of trace gases and light-

absorbing carbon from wood and dung cooking fires, garbage and crop residue burning, brick kilns, and other sources, *Atmospheric Chemistry and Physics*, 16, 11043-11081, 10.5194/acp-16-11043-2016, 2016.

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