Response to Reviewer

Thank you for your commendation and appreciate your suggestions on all scientific, technical aspects of our article. The manuscript has been revised accordingly. Listed below is our point-to-point response to each comment.

The responses address the referee comments sufficiently and this manuscript should now be published. I do suggest that the authors add a discussion of how the findings in this work relate to the model findings in Zhao et al (SciRep 2016), who found that accounting for semi-volatile POA and IVOC emissions from vehicles in a version on CMAQ including the 2D-VBS led to a large enhancement in the modeled SOA and significant improvements in model-measurement agreement for Eastern China. However, as I am a co-author on that paper I also emphasize that this is a suggestion and in no way a requirement.

Response: Thanks for the suggestion. One sentence is added between Line 286 to Line 288: "In addition, using CMAQ and 2D-VBS box model, previous study showed that oxidation of semi-volatile POA and IVOCs from vehicles was an important source of SOA in China, and the model-measurement agreement was improved significantly when they were taken into consideration (Zhao et al., 2016)".

Reference

Zhao, B., Wang, S., Donahue, N. M., Jathar, S. H., Huang, X., Wu, W., Hao, J., and Robinson, A. L.: Quantifying the effect of organic aerosol aging and intermediate-volatility emissions on regional-scale aerosol pollution in China, Scientific Reports, 6, 10.1038/srep28815, 2016.