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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Nepal Ambient Monitoring and Source Testing Experiment (NAMaSTE): Emissions of particulate matter and sulfur dioxide from vehicles and brick kilns and their impacts on air quality in the Kathmandu Valley, Nepal" *by* Min Zhong et al.

Anonymous Referee #2

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The concentration of different air-pollutants was simultaneously measured and evaluated using WRF-Chem in "Nepal Ambient Monitoring and Source Testing Experiment (NAMaSTE): Emissions of particulate matter and sulfur dioxide from vehicles and brick kilns and their impacts on air quality in the Kathmandu Valley, Nepal". Authors have done a non-trivial work by updating an existing emission inventory for Kathmandu Valley. However, there are some issues need to be resolved. 1. The authors have mentioned that "Since we lack survey data for trucks and cars in Kathmandu, we used the

data from Pune, India for these two types of vehicles" (Section 2.2.1). Using survey data of a western Indian city could increase the uncertainty related to the emission calculation. Authors, therefore, must include some logical arguments to establish the reasons behind using survey data of Pune in Kathmandu. 2. The authors have assumed the emitted PM as PM2.5 (section 2.2.1). Gillies et al. (2001) have estimated the emission factor of PM2.5-10 from a tunnel experiment in Los Angeles as 26% of total PM. Handler et al. (2008) reported the mass emission of PM2.5-10 almost equals to PM2.5 during an on-road motor-vehicular study in Vienna. Therefore, the authors need to explain the reason behind their assumptions logically. 3. The IVE model gives an output of PM10 (IVE model user manual, V2.0). As this model does not provide direct OC and EC output, therefore, the authors have used factors derived from Kim Onah et al. 2010. I would like to request the authors not to use the reference of Shresta et al. (2013) in this line. They should mention the reference of Kim Onah et al. 2010. The uncertainty related to this conversion factor for PM-to-EC and PM-to-OC is very high as shown by Kim Onah et al. (2010), and also the study has been carried out in a different country with different fuel quality and different meteorology compared to the present study. Therefore, I would like to suggest the authors use some probabilistic methods where the uncertainty related to these conversion factors could be taken care of. Else, the authors could include a separate section describing the uncertainty and if possible quantify it. 4. The authors have nicely explained the reasons behind the underestimation of EC. As per as the underestimation of SO2 is concerned, the authors have repeatedly discussed the Bode site. There is a distinct discrepancy between measured and observed values of SO2 in all the sites which indicates the presence of another source of SO2 that is not being considered. The authors need to rewrite the section (4.4) and try to explain the reasons behind the underestimation.

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