Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2018-599-RC1, 2018


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 #1**

Received and published: 8 October 2018

The air quality in Kathmandu Valley is evaluated 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" paper by using an improved emissions inventory for road transport and brick kilns as input to a regional chemical transport model (WRF-Chem). Emissions estimation from road transport is based on the latest available data for vehicle registration and local emissions factors while for brick kilns the emissions were estimated



using measured emissions factors. This research provides to a better estimation of the impacts of emissions on air quality in Kathmandu, which is one of the most polluted city in Asia. The manuscript is well written and organised; however, to be published in ACP some additional explanations and corrections are needed.

General:

Scale concept should be introduced from the beginning since both emissions inventories and chemical transport models are built for either global, regional or local scale. For example, the relevance of nested model simulation for the Kathmandu Valley and its limitation for the specific conditions (e.g. orography) in this area should be discussed in section 2.1.

The study, among others, focuses on SO2. I would suggest a comparison of SO2 concentrations measured in Kathmandu Valley with different limit values (e.g. the limit value in European Union); this could be added on Figure 12.

Additional explanations should be provided for a better understanding of the validity of the comparison between pollutant concentrations from model simulations in 2015 and observation from 2013. Moreover, as input for the chemical transport model different emissions scenarios are used, i.e., HTAP for 2010 and emissions estimated in this study for the year 2015.

A section (e.g. 2.2.4 Emissions scenarios) about how the emissions scenarios were built is needed, including details about how HTAP emissions for Kathmandu Valley were derived; add a Table with emissions for each scenario. Please consult/add the following reference Li, M., Zhang, Q., Kurokawa, J., Woo, J.-H., He, K. B., Lu, Z., Ohara, T., Song, Y., Streets, D. G., Carmichael, G. R., Cheng, Y. F., Huo, H., Liu, F. Su, H., and Zheng, B.: MIX: a mosaic Asian anthropogenic emission inventory under the international collaboration framework of the MICS-Asia and HTAP, Atmos. Phys. Chem, 2017.

Since the brick kilns is missing in HTAP inventory, please delete from the Abstract and manuscript the statement “brick kilns account for nearly 70% of total sulfur dioxide (SO2) emissions from all sectors considered in HTAP_v2.2”.

Clean up repetitive information throughout the text.

In section 5, the importance of this study for a future policy on emissions mitigation in this region should be highlighted.

Specific/Main text:

45 – please check/correct the values

120 – for clarity, please specify what was measured during the field campaign “NAMaSTE” and what you compared

215 – please provide details about the observed surface SO2 concentrations at the monitoring stations in Kathmandu valley e.g. period/year

240 – replace “missions” with “emissions”

330 - please provide details about the observed EC concentrations at the monitoring stations in Kathmandu valley e.g. period/year

450 – please provided internet link/reference for “PANGAEA” and replace “will be available” with “are available”

Figures 5, 6 and 7 - please add legends

Figure 11 – are the Observations from April 2015?

Figure 12 - please provide explanation of the differences at “Bode” monitoring station

Supplementary Materials

Figure S2, caption – please delete “(HTAP_vehicle_brick)”

Table S1a, column “Age” – spell “K” out



Table S1a, column “Index” – provide the definition of the index

Table S1a, for line Truck/Bus Diesel Heavy FI Particulate/NOx None >161K km – please correct the information in the last four columns

Table S2 – please check the link http://www.ccacoalition.org/en/resources/factsheets-about-brick-kilns-south-and-south-east-a

Table S4, S5 – please provide references for the values in the tables.

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