Atmospheric
Chemistry
and Physics

Discussions

Interactive comment on "Development of a high temporal-spatial resolution vehicle emission inventory based on NRT traffic data and its impact on air pollution in Beijing – Part 1: Development and evaluation of vehicle emission inventory" by B. Y. Jing et al.

B. Y. Jing et al.

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1 Title According to the title, the whole study concludes two parts, and the paper is part 1. The title of the paper cannot summarize well the whole content of the paper. Because the paper only built a high temporal-spatial resolution emission inventory, not more content describe the impact on air quality of Beijing.

Response: Thanks for your suggestion. The paper is the first part working in all. The

impact on air quality of Beijing was described in a companion paper, which name is "Development of a vehicle emission inventory with high temporal–spatial resolution based on NRT traffic data and its impact on air pollution in Beijing – Part 2: Impact of vehicle emission on urban air quality".

2 Abstract The abstract still need huge improvement to be concise. Authors use more words to describe study aim, etc. Abstract should summarize results and conclusions.

Response: Thank you for your suggestion. We had modified the abstract according to your remind, as follows: This paper presents a bottom-up methodology based on the local emission factors, complemented with the widely used emission factors of Computer Programme to Calculate Emissions from Road Transport (COPERT) model and near real time (NRT) traffic data on road segments to develop a vehicle emission inventory with high temporal-spatial resolution (HTSVE) for the Beijing urban area. To simulate real-world vehicle emissions accurately, the road has been divided into segments according to the driving cycle (traffic speed) on this road segment. The results show that the vehicle emissions of NOx, CO, HC and PM were 10.54×104, 42.51×104 and 2.13×104 and 0.41×104 Mg, respectively. The vehicle emissions and fuel consumption estimated by the model were compared with the China Vehicle Emission Control Annual Report and fuel sales thereafter. The grid-based emissions were also compared with the vehicular emission inventory developed by the macro-scale approach. This method indicates that the bottom-up approach better estimates the levels and spatial distribution of vehicle emissions than the macro-scale method, which relies on more information. Based on the results of this study, improved air quality simulation and the contribution of vehicle emission to ambient pollutant concentration in Beijing have been investigated in a companion paper (He et al. 2015).

3 Results and Discussions "3.25 comparison between fuel consumption and fuel sales", the section has not too much relation with the whole the paper.

Response: This section was aimed to evaluate the accuracy of vehicle emission in-

ventory through the comparison between estimated fuel consumption and fuel sales in Beijing urban area indirectly.

4 Tables and Figures "Table 2" and "Table 3" can be integrated into a table. Table 2 shows weekday variation, whereas Table 3 presents weekend variation. They are put into a table to provide a comparison. Similarly, "Table 4" and "Table 5" can be combined a table.

Response: Thank you for your suggestion. We had integrated two set of table in the paper.

6 Technical errors The same as "8 to 9 am", "from 5 to 6 p. m" should be "5 to 6 p. m".

Response: Thank you for your advice. We had revised these clerical errors.