Atmospheric
Chemistry
and Physics
Discussions

Open Access

Interactive comment on "Factors controlling pollutant plume length downwind of major roadways in nocturnal surface inversions" *by* W. Choi et al.

Anonymous Referee #2

Received and published: 29 December 2013

This is an interesting article that uses some of the data collected during earlier work (Choi et al 2012) of the authors and the UFP data is assessed here. While the article provides some interesting curve-fitting results, there are a number of technical concerns as well as transparency issues in writing and presenting the article. For instance, it is hardly mentioned where measurements were taken – where these measurements were mobile or stationary at fixed locations? How does the measurement locations suitable for applying the standard Gaussian equations. These details of measurements are important but missing and referred to another paper – some top level information should be included. A schematic depicting the site and the measurements

location would assist readers to understand these clearly.

Authors are using the data in parts in various papers and as a result a lot of important information which authors seems to keep for a follow up article (Choi et al. 2013) is missing and crucial for the development of the arguments. The authors should first clearly present the measurements and their analysis before moving to their modelling and data fitting.

Moreover, as authors mentioned by themselves, this is a too simple approach to deal with the UFP modelling – using a simple Gaussian equation without taking into account the (i) transformation processes which are likely to affect the concentrations notably because of high UFP concentrations, and (ii) any treatment of the traffic related turbulence as well as the roughness effects is too simplistic, raising serious concerns about the practical applicability of the results obtained.

The authors treat the UFP as a single entity based on their numbers but the dispersion behaviour of nucleation (<30 nm) and accumulation mode particles is completely different and should not be dealt as same.

Effect of temperature is discussed, though this does not seem to be mentioned anywhere in the article, what was the temperature and its variation. Given that the measurements are considered during the morning hours and therefore a huge temperature difference is likely to occur during measurements. How did author apportion this effect?

Given the way the data used is presented and standard approach applied to UFP modelling and considering the usefulness of the results obtained, the article need much more in-depth thinking and analysis to make it useful for the readers.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 25253, 2013.