Atmos. Chem. Phys. Discuss., 10, C341–C343, 2010
www.atmos-chem-phys-discuss.net/10/C341/2010/


Atmospheric Chemistry and Physics Discussions

# *Interactive comment on* "Short-term variation in near-highway air pollutant gradients on a winter morning" *by* J. L. Durant et al.

**Anonymous Referee #1**

Received and published: 3 March 2010

**General Comments:**

This manuscript describes a study characterizing short-term temporal variation of vehicular pollutant gradients within 200–400m of a major highway (>150 000 vehicles/d) near Interstate 93 in Somerville (Massachusetts) from 06:00 to 11:00 on 16

January 2008 using a mobile monitoring platform equipped with instruments that measured ultrafine and fine particles (6–1000 nm, particle number concentration (PNC)); particle-phase (>30 nm) NO-3 , SO2- 4 , and organic compounds; volatile organic compounds (VOCs); and CO2, NO, NO2, and O3. The results of this interesting and well executed study show that pollutant levels change rapidly as a function of atmospheric mixing conditions and chemical reactions over short distances near highways, consistent with many other recent publications of the past several years. Indeed the spatial



variability of air pollutants emitted by traffic sources a significant challenge in conducting population exposure assessment to these pollutants and increases the likelihood of exposure misclassification.

The paper is well written and generally easy to follow. The experimental part, data analyses and discussion are all well presented and articulated. The biggest issue that I have with this paper is the limited data, literally taken during the course of one day in January of 2008, and thus the generalizability of the results as well as the new information or insight that they bring to na over-studied topic.

Looking at the data presented in figures 1-7, they are all consistent with prior studies, which they authors properly acknowledge, so I am left with the question of what is new, exciting and noteworthy about this new data set (again taken over 1 day in winter fo 2008), other than a new location (which is not terribly different than any other US freeway) and more or less the same set of instruments plus the AMS. The data generated by the latter are "fancy" but don't shed any new light on the observations of many publications already on the same subject.

I will leave it up to the editor to decide on whether an extra study that corroborates the result of many others warrants publication. As I noted earlier, other than this point, the paper is well written and the approach and overall findings sound and robust.

Few additional comments:

- Figures 4 an and 4 b have been mixed up in the text
- Significance section- again I applaud the authors effort to add this section in an attempt to highlight the importance and perhaps uniqueness of their results. What troubles me is that none of the conclusions are new or contradict the results of freeway based studies with which we have frankly been inundated over the past several years. All of these studies are internally consistent and show essentially the same and obvious finding, i.e., that pollutants from vehicular emissions decay

exponentially with distance from freeways, with the decay rates depending on meteorological factors , time of day, and traffic volumes. How many additional studies of this nature in simply different locations do we really need?

---

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 5599, 2010.