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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Characterization of near-highway submicron aerosols in New York City with a high-resolution time-of-flight aerosol mass spectrometer" *by* Y. L. Sun et al.

Anonymous Referee #1

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This manuscript describes detailed chemical and physical characterization of aerosols in a typical roadside environment. Of four measurement periods, results from two morning rush-hour periods were discussed in detail. From different perspectives (mass concentration of organics from AMS, HOA factor contribution and tracer-based mass-weighted size distribution of HOA, as well as number-based size distribution from FMPS), these results revealed a strong influence of vehicle exhaust on organic aerosol composition in this near-road environment. Emission ratios of HOA and BC with respect to increase of CO2 were also estimated and agreed with equivalent parameters estimated for similar environments in the literature. This work is of great interest to the atmospheric research community as it presents results of real-world roadside situ-

ations with comprehensive measurements. The manuscript is well written; it should be published in ACP after some minor points, as below, being addressed.

General

1. The discussion on size distributions in this manuscript is an important part in this manuscript as it is a sub-section by itself, and the major conclusion is based primarily on this discussion. Two different particle size measures, Dva and Dm, were used as from AMS and FMPS, respectively. A note on the difference between the two and possible conversion (DeCarlo et al., AS&T, 2004) would be beneficial. Even better is presenting volume-weight size distribution from FMPS, so that a rough estimation of density of aerosols could be possible. In doing that, the authors can also include difference in particle density to further support the difference in chemical composition during LT and MT periods.

2. Line 27, page 30730: Was the wind from the north? By looking at Fig. 2, the wind direction was 120-240 deg. for the whole day of Jul. 28. And in a previous sentence (Line 22-23) on the same page, the authors just stated that the wind was persistently from QC campus, which is on the south.

3. This is a nice work on primary aerosol near roadside environments. But the authors attempted to put it in too broad a context. For example, the last sentence in the abstract tends to infer health impact without any information on how specific toxic compound (or group of compounds) are formed and change. The term “oxidation properties” (line 17, page 30752) is mentioned but the only hint on oxidation property is the regional characteristics of OOA factors, i.e., there is no result showing the oxidative chemistry per se in this typical roadside environment (see also minor comment c). Therefore, it is suggested that those general statements should be revised with a focus on the major conclusions about primary OA formation, which by themselves are very impressive already.

Specific

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a. Line 26, page 30733: a missing space in “tothose”.

b. Line 18, page 30736: delete redundant article “the” in “a the major fraction. . .”.

c. Line 16-18, page 30737: is this sentence a statement relevant to the current study? The results here do not imply any seasonal effects, nor do they show any direct evidence on photochemistry.

d. Table 1, page 30745: mismatch in columns.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 30719, 2011.

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