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Interactive comment on “Aerosol-CFD modelling of ultrafine and black carbon particle emission, dilution, and growth near roadways” by L. Huang et al.

Anonymous Referee #1

Received and published: 11 July 2014

The paper "Aerosol-CFD modelling of ultrafine and black carbon particle emission, dilution, and growth near roadways" discusses the impact of ABL modelling on the reliability of air quality predictions.

I have really enjoyed reading this manuscript. It is very comprehensive and it represents an excellent example of how the quality of turbulence modelling may impact the quality of prediction of physical and chemical processes. Although obvious, this aspect is usually underestimated. The present work considers turbulence modelling quite carefully.

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Given my expertise in the field of turbulence modelling, I will focus my comments on that part:

1) Recent studies (DOI: 10.1016/j.buildenv.2014.04.013) have shown that inflow and modelling parameters (e.g. aerodynamic roughness) can have a large impact on the prediction of ABL flows. You might consider investigating the sensitivity of your results to a few (key) uncertain parameters in BCs or physical models.

2) The ABL model is used everywhere in the domain without taking into account the possibility of employing a different approach for the wake regions, as it was done in 10.1007/s10546-011-9621-5. This could be fine depending on the zone of interest for pollutant analysis. However, I think it would be interesting to discuss/investigate the influence to that.

The above comments are meant as improvements to the manuscript, which I already consider worth of publication in the current form.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 12235, 2014.

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