

Interactive comment on “Characterizing the evolution of physical properties and mixing state of black carbon particles: from near a major highway to the broader urban plume in Los Angeles” by Trevor S. Krasowsky et al.

Anonymous Referee #2

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The manuscript covers the important issue of the evolution of BC properties from source to receptor site in two instalments. The first is a very short range study at a site just adjacent to a motorway, and the second is a more classic receptor site analysis focussing on much wider temporal and spatial scales. Albeit the methodology and instrumentation used at the two sites are very much the same, there are not really much in common in the two subtopics, though the manuscript suggests differently. The instrumentation used for rBC characterization is up-to-date just as the techniques used for the determination of the coating thickness of the BC particles.

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However, I have serious reservations regarding the experimental setup of the near-motorway measurements. The correct interpretation of such short-range rBC concentration measurements would have required simultaneous high-time resolution measurements of micrometeorological parameters, in particular wind speed and direction. Without these supporting measurement data evaluation based on (perpendicular) distance from the motorway only may be strongly flawed. More realistic ‘distance’ from the motorway, in the sense of the time allowed for microphysical (dispersion) processes to take place en route between the point of emission and the actual measurement site, depends strongly on these parameters and cannot be interpreted without knowing these. Distance in itself is meaningful only when all micrometeorological parameters, particularly wind directions and speeds are constant throughout all measurements carried out on four separate days. This is more than unlikely even within a single day, but definitely cannot be proven without supporting measurements. Therefore all the figures and conclusions that are based on perpendicular distance from the motorway are simply meaningless. I would also miss from the experimental setup simultaneous measurements of gaseous species from vehicular emissions, as well as upwind measurements from the other side of the motorway. Dispersion modelling would have also been useful to support the interpretation of the measured data.

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