

Interactive comment on “Top-down estimate of surface flux in the Los Angeles Basin using a mesoscale inverse modeling technique: assessing anthropogenic emissions of CO, NO_x and CO₂ and their impacts” by J. Brioude et al.

Anonymous Referee #2

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This manuscript describes an inverse modeling study examining emissions of CO, CO₂, and NO_x in the Los Angeles basin. It is generally well written and I only have a few items that the authors might consider clarifying in addition to comments from reviewer #1.

1) It is not clear why the authors chose to use a particle dispersion model in the inversion while having access to a full chemical transport model (at various configurations). It seems like NO/NO₂ ratios are dramatically different between emissions and ambient concentrations, and general reactivity of these species should be important. In particu-

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lar, this assumption seems like it needs more support: “changes in NO_y are interpreted as changes in NO_x emissions.”

2) What is the reason for subtracting background levels from measurements? What were the background levels? Where they constant?

3) It is not clear if inversions were done on each flight independently. If so, it might be worth commenting on the variability in the posteriors from each.

4) I would like to see more discussion on the applicability of this method to larger scale. The authors briefly mention that single flight inversion are possible on mesoscale given careful flight path planning (and probably favorable met conditions), but I am not convinced that this method picks up anything more than strong local sources. In fact, it might overestimate the influence of local sources depending on how exactly the “background” values came out. The interaction of local and transported air pollution is very important at current lower levels of emissions and seems to be a weakness of this methodology.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 31439, 2012.

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