

Interactive comment on “Aerosol plume transport and transformation in high spectral resolution lidar measurements and WRF-Flexpart simulations during the MILAGRO Field Campaign” by B. de Foy et al.

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We thank the referee for the careful review of the manuscript.

1. The WRF model used 41 vertical levels which is on the high end of common practice. As the comment suggests, it would be interesting to have a separate study on the impact of vertical resolution. Previous studies of vertical stratification in the MCMA region suggest that this question is intimately tied with the model of the planetary boundary layer (de Foy et al., 2007 and de Foy et al., 2009b). Our experience suggests that future

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improvements will require a combination of increased vertical resolution and improved models.

2. Given that Flexpart is a Lagrangian model and that simulations are performed individually for each source, the selection of the number of particles is based on the balance of the type of sources and the computational needs. More focused area sources such as the urban emissions can be simulated with more particles from fewer areas. In contrast, dust sources are ubiquitous and need to be simulated with fewer particles from a greater number of source areas. The description of the final scaling applied to combine the results will be improved in the manuscript.

Technical Comments:

Thank you for these comments, we will correct them in the final version of the paper. In particular, a full chemistry model could have been used for this study. However the focus was on transport and on linking impacts to sources. For this purpose, Flexpart is computationally cheaper and allows tracking of individual sources and particle ages. Thank you for pointing out that a large source of discrepancy between DUSTRAN and the official inventory maybe because DUSTRAN focuses on wind-blown dust from arid areas whereas the official inventory is focused on urban resuspension from vehicular traffic. This will be added to the text.

NB: References are the same as the ones in the paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 28471, 2010.

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