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Interactive comment on "Modelling the impact of sub-grid scale emission variability on upper-air concentration" *by* S. Galmarini et al.

S. Galmarini et al.

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Reply to reviewer 1

We thank the reviewer for his positive and constructive comments on the paper. All editorial comments are included in the final version of the manuscript. Regarding the requested additional runs:

1- New figures 7, 8 and 9 have been produced that include the concentration variance as generated by turbulence without the contribution of the emission production term.

2- We do not understand what the reviewer means with low turbulence. Turbulence in LES is not parameterized but explicit. The turbulence we are looking at is the one that is necessary to have a boundary layer fully formed in quasi steady state.

3- We have been quite clear and explicit on that in the introduction. We wrote: 'We will

not address here the role of the spatial distribution of the different sources in the sense of the actual position they occupy within the transport model cell but rather the fact that within the grid we consider the existence of a fine emission structure '. In the conclusion we indicated that as a future topic of research: ' 4. Develop a parametrization to account for the sub-grid topological orientation of the emission heterogeneity. '

As for the answers to the questions posed in the introduction we think they can be found in the conclusion quite explicitly stated and we would not like repeating them and having them explicitly answered in the conclusions.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 12289, 2007.