

## ***Interactive comment on “Modelling street level PM<sub>10</sub> concentrations across Europe: source apportionment and possible futures” by G. Kieseewetter et al.***

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We thank the Referee for his/her constructive comments and suggestions on how to improve the manuscript. Below we provide detailed point by point replies to the questions. Referee comments are quoted in *italicised* font.

*One key limitation of this study is that it only provides concentration projections for monitoring stations for which data are available for 2009 and indeed only for a subset of stations for which various data criteria have been met.*

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The methodology is indeed limited to the stations operational in 2009 which fulfil certain data coverage criteria. However, the model covers around 1870 stations, among them 445 or 80% of the stations which violated the limit value on daily mean PM<sub>10</sub> in 2009. Every model has its limitations, and setting up a model for every street in the whole EU is currently out of reach. It is a characteristic of our approach that it avoids going into the details of physically describing the individual streets (building layout, wind speeds etc) but is based on past monitoring data instead – thus inevitably restricting the set of locations that may be covered.

*Page 18325 line 19. I am not clear how delta PM10 has been defined or how this value is used in the calculations.*

$\Delta[\text{PM}_{10}]$  refers to the PM<sub>10</sub> roadside increment. It is defined in Equation 4 on p. 18323 (here the ACPD manuscript was updated from the originally submitted version). The modelled PM<sub>10</sub> roadside increment is constrained by the observations in the base year. We use the observed base year NO<sub>x</sub> roadside increment  $\Delta[\text{NO}_x]$  at the same station to derive the base year PM<sub>2.5</sub> roadside increment  $\Delta[\text{PM}_{2.5}]$ , and the coarse PM roadside increment  $\Delta[\text{PM}_{\text{coarse}}]$  in the base year is the residual  $\Delta[\text{PM}_{10}] - \Delta[\text{PM}_{2.5}]$ .

*Page 18330 Line 10. It is not clear whether these scaling factors of 8 and 4 have been applied to the domestic emission or not. Page 18326 line 19 implies that a method was derived to assign the residual to specific sources. Page 18330 Line 10 implies that the emission inventory was adjusted, so I am not clear what was done.*

In fact, both steps were necessary. The scaling factors for emissions in coal mining areas (applied flat across the whole provinces concerned to represent the use of low-quality coal) improve the average, but for individual stations the allocation of residuals is still undertaken. This is done consistently throughout Europe using the methodology described on p. 18326.

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