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Interactive comment on "Spatiotemporal evaluation of EMEP4UK-WRF v4.3 atmospheric chemistry transport simulations of health-related metrics for NO_2, O_3, PM_{10} and $PM_{2.5}$ for 2001–2010" *by* C. Lin et al.

Anonymous Referee #1

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The article presents a thorough evaluation of EMEP4UK model results against measurements of the AURN monitoring stations. While a thorough validation is a major and essential task when using an air quality model this article does not present any new insights or methodology on how such a validation should be done. Furthermore some of the presented validation work is IMO not complete and flawed to some extent. More specifically I have following remarks:

1) For some unclear reason the authors have omitted the root mean square (RMSE) statistic from their analysis. they base this e.a. on the Thunis et al., 2012 paper.

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Discussion paper

However in this paper even in the abstract the first statistic encountered is RMSE. In general there is agreement that a combination of bias, R and RMSE are best suited as each of these focuses on a different type of possible error in the model results when compared to observations.

2) On p. 13 line 10 - 14 the authors blame deviations between modeled and observed data (almost) completely on the observed data's lack on representativenes and measurement error. Problems in representativenes are rather a problem of incompatibility: both model and observations are representative at a certain scale (neither of which is better than the other). However, these scales could (and are often) incompatible but this is neither the fault of model or observation. Measurement error is indeed a concern but in practice model error often by far exceeds the measurement error.

2) In line with the previous remark, after reading the text I have some doubts on whether the authors have understood the full extent of the methodology presented to the FAIRMODE community and outlined in the articles by Thunis et al. (2012) to which they refer. A sentence like p13 line 21" The presence of measurement certainty degrades the values that can be expected from air quality model measurement statistics" is a case in point: in the methodology proposed by Thunis et al. measurement uncertainty is used as the 'ruler' by which model uncertainty is judged: more measurement uncertainty then effectively means that model results can also be more uncertain!

In the end I was therefore left somewhat disconcerted by the text. Amassing all these results in a, admittedly, clear form must have been a major undertaking but there is not really anything new here. Worse yet, the authors seem to have missed some of the points made in the articles that they refer. I therefore recommend not publishing this article.

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