

Review of (gmd-2016-183): Spatiotemporal evaluation of EMEP4UK-WRF atmospheric chemistry transport simulations of health-related metrics for NO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> for 2001-2010 by C. Lin et al.

The Authors present in this work a thorough evaluation of the EMEP4UK-WRF model system applied over the UK for a series of meteorological years. This is a challenging task and the Authors succeeded to present it in a systematic and organised manner (different time periods, pollutants...). Having read the two other Reviewer's comments and the response of the Authors to those comments, I would make the following two comments.

- 1) I agree with Reviewer one regarding the use of the RMSE. Even though the Authors state that the correlation and bias are the two most appropriate statistics given their health oriented purpose, I believe it is important to add RMSE to those two statistics. It is particularly important in the discussion section where the values reported by Thunis et al. (2012) are used to judge the quality of the EMEP4UK-WRF results. It is clearly stated in Thunis et al. that the fulfilment of the criteria on bias, correlation and standard deviation is a necessary but not sufficient condition to assess the quality of the model results, and that the RMSE remains the key indicator to do this. I would therefore encourage the Authors to add this statistics to their work. I would also suggest them to use the latest uncertainty parameter values as reported in the Fairmode documents (available on the web portal).
- 2) The use of the RMSE indicator would certainly clearly show that the traffic stations should not be used in this evaluation. Many published works have shown the inadequacy of a 5x5 km resolution model to capture street concentrations, especially for O<sub>3</sub> or NO<sub>2</sub>. I believe these stations should be withdrawn at start from this work. The Authors refer to the underestimation of local scale emissions but these issues are well known and keeping these traffic stations together with the others is confusing for this type of model application.

In conclusion I believe this work is worth publishing but some major revisions would be needed.