

Interactive comment on “Air quality trends in Europe over the past decade: a first multi-model assessment” by A. Colette et al.

Anonymous Referee #1

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General Comments: This paper presents the results from a model inter-comparison study that evaluates model performance based on the ability to reproduce the observed trends in NO₂, PM₁₀, and O₃ across Europe, with a focus on urban areas. The analysis is very thorough and good evaluations are done. With the exception of a few specific comments and technical corrections, I would recommend the manuscript for publication.

Specific Comments (scientific questions/issues):

-Section 2.1: Why was PM_{2.5} not chosen as it is a more relevant human health metric. If there was a valid reason for this, you might want to include/mention this here.

-Section 3.1 paragraph2: Wouldn't this affect the trend – using the same emissions

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at the beginning of the time series, such that up to the first 3 years are all the same emissions in some areas?

-P19040 L5-6: It might be useful to list a few examples of the well-documented limitations of the emission inventories here, as they may or may not be relevant to the results of this assessment.

-P19043 L14-15: Why were suburban background stations chosen over urban background stations?

-P19056, last P: is it really that VOC reductions were not aggressive enough? Or could it also be due to less titration of O₃ from NO_x emission reductions? Although you cite one paper that mentions this, this is also a modeling paper, are there any other papers that address VOC reductions for Europe in observations?

-Was there a reason for not giving a final assessment of the models in the conclusion that would sum up the strengths/weaknesses of the models, as a whole, or as a group, global/regional with respect to their utility for air pollution trend modeling?

Technical Corrections:

-The article should be written using past tense.

-P19031L2 and throughout: 'inter annual' should be written as one word, 'interannual'.

-P19031 L14: 'trends of secondary species such as O₃ is more challenging.' should be past tense (as mentioned previously) but also plural: were.

-P19032 L29: 'Furthermore, the changing economical and industrial context...' economical should be economic.

-P10933 L15-17: Something is missing in this sentence, should it read 'The scope was to attempt [to reproduce] air quality trends in air pollution hotspots with an ensemble of models in order to investigate the performance of existing tools.'?

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-P10934 L24 and P10935 L2-3 and P10938 L10&11: '(Vautard et al., 2006; Løvblad et al., 2004) follow this...'. The citations should be edited so that the author names are not in parentheses.

-P10938 L23: 'The stringiest criteria...' stringiest should be 'most stringent'.

-P19050 L3: It would be good to specify 'ozone precursor emissions' here.

-P19050 L13: It should say '...has an impact on sea salt emissions.'

-P19050 L20: The part in parentheses doesn't make any sense, 'Assuming that this mismatch is not due to a model shortcoming (that shows to perform well elsewhere), either such trends are inappropriately reported in the Emep inventory...'

-P19051 L13: '...de de-seasonalised time series...' should be '... the de-seasonalised ...'

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 19029, 2011.