

Interactive comment on “Comparison of modelled and monitored deposition fluxes of sulphur and nitrogen to ICP-forest sites in Europe” by O. Westling et al.

Anonymous Referee #4

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General comments: This paper presents a useful and sound comparison of modelled and measured total and wet depositions, concentrations and amounts of precipitation.

Specific comments: Abstract: The abstract is now formulated in such a way that it is not always clear whether deposition is wet deposition, dry deposition or total deposition. The abstract should to start with mention what is compared (precipitation amount, total deposition of SO₄²⁻ to coniferous and deciduous forests, wet deposition of SO₄²⁻, NO₃⁻ and NH₄⁺ in the open field, concentrations of SO₄²⁻, NO₃⁻ and NH₄⁺ in precipitation. Information on the results for total deposition of SO₄²⁻ to coniferous and deciduous forests should be included in the abstract. The use of the word EMEP in the abstract (and in the rest of the paper) can be confusing as it can refer to either the EMEP model or the EMEP monitoring network. For that reason either “model” or

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“monitoring network” should be added to “EMEP”.

Introduction. Here we compare the results of the EMEP model with a completely independent dataset..... This is mentioned in contrast to a comparison between the results of the EMEP model and monitoring data at EMEP sites mentioned in the previous line. This could suggest that the EMEP monitoring data are not independent of the EMEP model results. This is, however, not true. The results of both the model and measurements are done by the same organisation, but are in fact completely independent. So better leave the expression “completely independent” out. The end of the introduction is a bit abrupt. I would prefer that at the end of the introduction is referred to what is presented in the next sections.

p. 938. “Only measured bulk deposition of N in open field is compared with model calculated wet deposition by EMEP.” Bulk precipitation consists of wet deposition and some dry deposition to the open funnel. For that reason it would be useful that to refer here to a publication that discusses this difference (which usually is not too large).

p. 939. “Smith and Fowler (2001) suggested that rainfall amounts for 5x5 km² in the UK could be uncertain by between 30-50%.” Mention here also the length of the period as the uncertainty decreases with the length of the period.

p. 941. Mention also why the years 1997 and 2000 chosen.

I am not sure that tables 2-6 are needed. They give an impression of how the frequency distribution of the amount of precipitation and deposition for the EMEP model results for the grid elements that contain ICP stations and the same distribution for the data measured at the ICP stations. The tables do not give information on whether the geographical distribution is the same. I would suggest to drop these tables as the figures already contain much of this information. If necessary some lines could be added to the text on mean/median values.

p.945. “..., but the modelled data should be 5 to 15% lower due to dry deposition in

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observed data in open field with bulk samplers.” Make this sentence more clear and add a reference.

In general: It would be useful if information were given on the possible horizontal gradients within an EMEP grid element of 50x50 km² and if this information were used in the interpretation, but this is maybe difficult to achieve.

p. 948. Is there any explanation for the difference between the comparison of with the ICP stations and the comparison with the EMEP stations. If not, this should also be mentioned.

Technical corrections:

p. 941. Use a full name for the institute MET.NO

p. 948. line 15. “ a comparison of the EMEP chemical transport model” should be “a comparison of the results of the EMEP chemical transport model”

Several places in the article: “EMEP grids” should be “EMEP grid elements”.

p. 947. (CCC: 2004) should be (CCC, 2004)

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