

Interactive comment on “SCIAMACHY formaldehyde observations: constraint for isoprene emissions over Europe?” by G. Dufour et al.

Anonymous Referee #2

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This study analyzes SCIAMACHY observations and model simulations of formaldehyde columns over Europe. Europe is a region that has been studied very little so far in terms of biogenic emissions and where such research poses higher challenges. Isoprene emissions over Europe and as a result formaldehyde levels are generally weaker compared to many other regions and well mixed with anthropogenic contributions.

Model tracers of different sources for formaldehyde are used to interpret model-measurement differences and the authors find that besides model and observational errors, discrepancies are related to a misinterpretation of biogenic emissions. Error analyses suggest that with appropriate averaging SCIAMACHY observations can be

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used for constraining isoprene emissions reducing uncertainties by more than 50% in high emitting regions.

This is an interesting study and the results are presented in a clear manner. The one major comment I have is that the paper feels incomplete. The authors build up to an inverse study for biogenic emissions over Europe and suddenly end the paper. I wonder why, with all the preparation work already done, this final last step has not been completed? Adding it would make the paper certainly much more valuable by demonstrating the applicability of the tools or allowing future studies a comparison to European emission estimates just to mention some of the benefits.

Besides this comment, I think the paper is well written and I have only some more specific but rather minor comments to add:

Page 19274, Line 7: Change to something like "... on Europe, a region studied very little so far ..."

Page 19279, Line 2-3: TUV in your model does not consider the effect of clouds and aerosols?

Page 19282, first two paragraphs: You describe the different contributions to formaldehyde, but it would be good to also visualize them. I suggest adding in Figure 3 also the model contributions from background, and isoprene and terpene oxidation.

Page 19285, Line 22ff: Please specify the correlation coefficients.

Page 19289, Line 4-7: Sentence needs to be re-written

Table 3: Add the standard deviations to your mean values

Table 4: Why do you only specify the standard deviation for the observations and not also for the model values?

Figure 4: The caption does not seem to belong to this figure

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