

Interactive comment on “SMOKE for Europe – adaptation, modification and evaluation of a comprehensive emission model for Europe” by J. Bieser et al.

J. Bieser et al.

johannes.bieser@gkss.de

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Q: I would suggest relating a bit more the methodology that has been developed in the present work to what others are doing (e.g. does other emission models use surrogates? If so, which ones?).

A: We included a description of the surrogates used by the TNO and the EMEP emission models in Sect. 3.1.

Q: P954, L5: There are differences between ‘plume rise calculations’ and ‘Plume in Grid (PiG) calculations’. I am not sure what the authors are referring to for the treatment of large point sources. I guess that the authors are referring to ‘plume rise calculations’.

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This needs to be clarified in the manuscript.

A: We are using plume rise calculations to determine the effective emission heights of point sources. Thank you for pointing out the incorrect terminology.

Q: P966, L22: “For Switzerland, which is one of the smallest European countries, differences of up to 20% in annual total emissions have been found in certain grid cells.” How can we get differences in annual total emissions? Whether Modmat is used or not, annual total emissions are the same. Please explain.

A: In the reference setup only the population density was used to distribute the emissions. Because of the different annual heating demand in each grid cell, the spatial distribution of the emissions is changed by the Modmat module. The total emissions for each country remains equal. For Switzerland the large differences can be explained by differences in the annual heating demand north and south of the Alpes. This has been clarified in the text.

We included all of the ~200 editorial suggestions into the paper.

We want to thank the referee for his thorough review which helped to improve the readability of this paper substantially.

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