**Geoscientific
Model Development
Discussions**

Interactive comment on "A pre-processor of trace gases and aerosols emission fields for regional and global atmospheric chemistry models" *by* S. R. Freitas et al.

Anonymous Referee #2

Received and published: 14 October 2010

Comment to Freitas et al.

General: The authors present an interface to combine sources of emission data to obtain a full emission inventory for the use in CTM/CCM simulations. The work is relevant for modelling groups and should be published in GMD after major revisions.

1. Clarify what is PREP-CHEM-SRC and what is done outside (e.g. emission preparation). The tool is quite complicated. Sometimes data are combined, somtimes just read and interpolated. It would behelpful to have one section summarizing this. E.g. by a graphic, which clearly states for each source category what is the input, what is PREP-CHEM-SRC doing. This has to be very clear to understand the potential of the

tool. Examples: 2.3 Eq. (1) is included in the tool, right? page 860 l 5: the combination of the three products is not included in the tool? I am really not sure what is included and what has been taken from other sources as an Input.

2. Grid-scales

Nothing is said on how the data are transformed to other grids. (see e.g. Jöckel, 2006, www.atmos-chem-phys.net/6/3557/2006/) How is it done? Is it strictly mass conserving? Are there choices between intensive and extensive variables?) Please include a section on this.

3. Check english and math

- E.g. look for the use of adverbs: p 865 mostly-> most, directed-> directly, and other places

- E.g. Eq. (4) $\tilde{E}_\eta$ should be $\tilde{E}_\eta(k)$

- Eq. (7) Acvtually I do not understand this eq. I think It should be like:

E(k) = lamba * (top term) + of (1-lambda) *Sum(over k)(bottom term)

4. versioning

Please include a version number (Name of tool + version also in the title). Otherwise it is not possible to differentiate between this paper and possible upcoming papers, including updates.

5. Limitations

Please include a discussion on the possibilities to add new features, aircraft emissions, lightning, or new approaches for emissions. How modular is the code. What is required if someone wants to combine this code with own routines. State clearly that it does not calculate emission in a top-down or bottom up approach like the SMOKE model (e.g. GMDD Bieser et al.)

6. Output How is the output structured? Is it possible to get individual categories (biomass burning, road traffic) as individual data to calculate the impact of such emissions?

Other things:

P 856 l 9-10: Please rephrase: e.g. "also detailed"-> "presented"

Abstract: Clearly state what is included in the tool and what kind of data are Input.

P 856 l20 can you include a reference or list to whom or to what data you are referring?

P857 change "have been used by CCATT.." "were included in the models CCATT.. "

P858: Would it be possible to include an overview table showing which species are included for which emission output?

P860 I do not understand the sentence "... 8-day and 1 month timesteps." please rephrase

P863 l6 please includ "mass" mixing.

P867/8 please include references to the previous section, whenever possible.

868 Please clarify: RETRO update is part of PREP-CHEM-SRC

(Very minor: Is PREP-CHEM-SRC really the tool abbreviation of your choice? What's about PREMIS (Preparation of emissions) or PREPEMIS1.0, etc. Just a suggestion.)

Appendix A

Please revise table: List of subroutine + short description what it is doing

Figures

Fig. 2: Please include units at the axis h and 1/s? You also could include the function for no diurnal cycle as an illustrative example =1.5e-5?

Fig4 Please include units and numbers in B

Fig. 8 what id G5? Please revise the plot, the numbers cannot be read! perhaps 2 lat x long plots would be more appropriate?

Interactive comment on Geosci. Model Dev. Discuss., 3, 855, 2010.