

Interactive comment on “An operational system for the assimilation of satellite information on wild-land fires for the needs of air quality modelling and forecasting” by M. Sofiev et al.

Anonymous Referee #2

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General comments This manuscript describes the development of a system to assimilate satellite information on wild-land fires into an air quality modelling and forecasting system. The manuscripts add new insight to this relevant subject for ACP and the manuscript is in general scientific sound. The applied modelling system and the results are presented and discussed. However there are needs for clarification of some parts of the manuscript (see comments below). The title reflects the contents of the paper and the abstract provide a concise and complete summary. The manuscript is well structured and in general it is well written and clear. However, there are several errors and the quality of the figures is not very good (see comments and corrections below).

Specific comments The authors evaluate the modelling system including the two different FAS parameterisations against satellite observations. But the authors do not describe how much better the system performs with the FAS than without the FAS. A comparison of the performance of the model system with/without FAS would highly enhance the scientific value of this manuscript.

Section 2.5 Examples of the simulations and comparison with the MODIS and ground-based observations I do not agree with some of the conclusions in this section, and some of the result analysis is not transparent. Page 6495, lines 26-29. The authors state that the scatter plots for FAS-TA is wider spread than the FRP based. This is not clear from figure 9, which I believe shows the opposite. Furthermore, there are some interesting patterns in Figure 9, e.g. the shift from low to relatively larger scatter of simulated PM_{2.5} concentrations for MODIS concentrations larger than ~10 $\mu\text{g}/\text{m}^3$. This is not discussed at all. Page 6496, first paragraph. The presentation of the results shown in Figure 10 is not transparent and these results are not discussed in the discussion section. What is the purpose of calculating the spatial correlation coefficient, figure of merit in space, RMSE and bias, what do these statistical figures represent and how are the results in the context of this study? Please be more clear on this subject.

Page 6496, line 16-17. 'A similar approach was used by e.g. Ichoku & Kaufman (2005)'. Who else have applied this approach? Please give other references here. If no one else, please omit 'e.g.'.

Page 6498, lines 1-5. This sentence is not clear. It is not clear what the authors have done in the sensitivity study and what effect it has on the simulations. Please make this paragraph more clear.

Page 6498, line 12. '...can be as large as a factor of several times.' Please specify (how much is several times?), to add to the scientific transparency.

The Figures are generally quite small, which reduces the readability of the manuscript. In a few examples, this can be improved easily: Figure 5. The scales are much larger

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than the point-filled space, please remove the empty space. Remove also the fitting equation from the plot, since this is repeated in the caption. Figure 6. The scales on these two figures are too small and barely readable. Remove also the fitting equation. In the figure captions there are upper and lower panels, which should be left ad right panels. Figure 7 and 8. In the header for these figures there are information that are not used, please remove this unnecessary header information. Figure 8. There is no unit on the colour scale.

Technical corrections Page 6485, line 4. Please correct 'Brasilia' to 'Brazil'.

Page 6485, line 5-6. Please correct 'Total estimates of the consumed biomass...' to 'Estimates of the total consumed biomass...'.

Page 6485, line 6. Please correct 'rangin' to 'ranging'.

Page 6486, line 3. Please insert 'the' before 'mid-1990s'.

Page 6486, line 23. Please insert 'the' before 'Present'.

Page 6488, line 14. Please insert 'the' before '4'.

Page 6488, line 26. Please correct 'Kufman' to 'Kaufman'.

Page 6489, line 24. Please insert 'the' before '2006'

Page 6489, line 25. Please correct 'sufficient episode duration' to 'sufficient duration of the episode'.

Page 6490, line 20. Please delete 'was'

Page 6490, line 28. This sentence will become clearer if 'from fires' is inserted between 'emission' and 'was'.

Page 6494, line 22. '...about two hours one after another ...'. The meaning of this sentence is not quite clear. I suggest to rephrase this to: 'over two consecutive hours' (if this is what is intended meaning of the sentence).

Page 6494, line 25. Please insert 'a' before 'certain'.

Page 6495, line 7. Please insert 'August' before '2008'.

Page 6495, line 8. 'concentraions'. Of what? Please specify.

Page 6495, line 15. I suggest correcting 'against' to 'compared to', since the latter is more concise.

Page 6495, line 22. The caption to Figure 7 says '3 May'; not '5 March'. Please correct this.

Page 6502, line 9-13. The references Schultz et al., 2008 and Scholes and Andrea appear twice. Please remove them.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 6483, 2009.

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