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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Global impact of contemporary smoke aerosols from landscape fires on climate and the Hadley circulation" *by* M. G. Tosca et al.

Anonymous Referee #2

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The manuscript requires some revisions before submitting again. 1) It is quite confusion whether the initial simulation was 2x GFDv3 (p. 28077, line 2) or 1x GFDv.3 (p. 28097, Table 1). Are the unadjusted BC emissions 1x or 2x GFDv3, and the adjusted BC emissions about 2x or 4x GFDv3 (e.g. Table 2)? Please clarify.

2) p. 28076, line 14: The emission factors of Andreae and Merlet (2001) have been updated by several publications, such as Akagi et al., ACP 11, 4039-4072, 2011. What are the differences in BC emission factors of the two publications? Do the differences affect the results of CAM5 simulations? I suggest using Akagi's compiled emission factors to redo CAM5 simulations.

3) p. 28076, line 21: How do you handle the spatial scale difference in GFDv3 (0.5o x 0.5o, monthly) and the climate drivers (0.75o x 0.75o, monthly) for model simulation?

4) P. 28076, line 28: Explain why GFDv3 smoke emissions were underestimated by a factor of 2 which is very significant.

5) p. 28078, line 1: What are the standard deviations of the mean scale factors?

6) p. 28097, Table 1: Why is the MODIS scalar much higher than MISR scalar for most of the regions?

7) p. 28097, Table 1: Why are AERONET dataset not used for scaling GFDv3 emissions?

8) p. 28099, Table 3: Are the differences between observed and modeled optical depths statistically significant?

9) p. 28102, Fig. 2, add r2 to the figures.

10) p. 28103, Fig. 3, add r2 and slopes to the figures.

11) p. 28105, Fig. 5, Label (a), (b), (c) and (d) to each figure.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 28069, 2012.