Atmos. Chem. Phys. Discuss., 10, C3734–C3735, 2010
www.atmos-chem-phys-discuss.net/10/C3734/2010/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Climate effects of seasonally varying biomass burning emitted carbonaceous aerosols (BBCA)" *by* G.-R. Jeong and C. Wang

Anonymous Referee #1

Received and published: 8 June 2010

The authors use aerosol-climate model with two sets of biomass burning carbonaceous aerosols emission data that respectively includes and excludes seasonality. They study the climate effects of seasonal emissions using 60-year simulations. They show that while the direct radiative forcing is in phase with seasonal changes in biomass burning and in the same locations, the non direct radiative forcing extend to other areas due to effects on cloud distribution and precipitation.

The topic of this paper is important and interesting. Such study should be published. However, there are few problems with the presentation of the results and the paper misses a serious discussion on the model's limitations. Moreover, the model results

are presented without any validation from satellite data or any other source.

Specifically: great part of the model results are attributed to clouds. It is not always clear which effect on clouds is the reason for the presented results. Is it changes in cloud properties due to aerosol absorption? Or is it due to indirect effects (on cloud microphysics). In any case, since clouds are the main player in this study, it is important to understand the model potential (and limitations) to describe realistic clouds and realistic aerosol effects on clouds. This is a key issue here especially because it is a challenging task and it is not clear which models are capable in doing so. A non modeler reader (or even one who uses other models) does not have the tools to judge or evaluate the quality and the correctness of the presented model output. Can the authors provide a validation and references for the model capabilities?

Lastly a comment on the presentation of the results: The results part is too dense and is hard to follow. The authors show many results of numerous attributes using acronyms. It would be nice if they consider expending the results part and showing them one by one with more details and less acronyms. The Hovmoller diagrams are very informative but could be presented better. First, it would be nice if they will rotate the figure in order to have the latitude information in the vertical axis. Then they should consider showing Hovmoller averaged over a limited range of longitudes, showing the selected attribute evolution in time for more specific places. This can be shown together with the current (360 degrees averaged) Hovmoller figures.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 9431, 2010.