

Interactive comment on “The interactive global fire module pyrE” by Keren Mezuman et al.

Keren Mezuman et al.

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We would like to thank the referees for their comments and in depth review of this paper. We have addressed all comments as described below, where the referee comments appear in bold, our responses are in italic below. An important point to make is that we renamed “fire count” to “active fires” throughout the manuscript.

We would like to add that this manuscripts’ main goal is to describe the fire model pyrE, that is now an interactive component of modelE, the NASA GISS Earth System Model. The fire module is based on an earlier off-line code development by Pechony and Shindell (2009,2010), and has been extended in its functionality, which is explained in detail in the paper. Now that the fire model is an integral part of the climate model, a detailed description and evaluation as presented here seemed essential from our point of view, in order to provide a full description of the functionalities of modelE.

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Response to Referee #1: General comments In this manuscript, the authors describe pyrE, a new fire module for the ModelE Earth System Model. pyrE builds upon work by previous authors but includes some novel elements that could be of interest to the broader community of global fire modelers. The authors present not only the direct outputs of pyrE (which performs acceptably, especially considering the huge variation in performance seen in global fire models), but also evaluate its impact on ModelE’s representation of atmospheric chemistry, specifically with regard to aerosol optical depth. There is nothing especially groundbreaking presented here, but the manuscript represents a well-written and (mostly) thorough documentation of an important part of an Earth system model – something exactly appropriate for publication in this journal. However, the authors need to be much clearer about the choices they had to make because of limitations of their vegetation model, and better place these choices into the context of previously published fire models. My main criticism has to do with the authors’ contextualization of their decision to tie emissions to fire count. This begins in the Abstract:

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2019-263>, 2019.

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