

Review of second revision of Hansen et al. for Atmospheric Chemistry and Physics

General Comments

In the second revised submission of “Haze in Singapore - Source Attribution of Biomass Burning from Southeast Asia”, Hansen et al. responded to the comments made in the first two rounds of reviews. Importantly, they clarified the application of the forward and backward runs of NAME. The backward run of NAME was done to identify the extent of the domain necessary for forward Lagrangian modeling with tagging of particles. The forward run was then conducted with particles that were tagged with the source region. This method is appropriately deemed source attribution. Since some other authors have used the information in the backwards run with observations to ascertain emissions rates, it should be clear that the only utility of the backward run was to show the extent of the domain. The “air history maps” do not contribute at all to the estimate of the influence of biomass burning on the sites; all of this information comes from the forward execution of NAME. Therefore, I would recommend changing the order of the methods section by moving 2.4 to 2.3 so that the backwards run can be described as a forerunner to the forwards runs.

The poor agreement between the model and observations is still concerning, but the authors have characterized this error. Since the observations are not used in ascertaining emissions rates, the reader is left to understand that the “source attribution” is only of the modeled concentrations rather than those observed. To this point, the authors seem to indicate in the responses to Reviewer 2 that “attribution” differs from “apportionment”, which seems to be the justification for not treating the background concentration or other sources of PM₁₀ more carefully. However, any literature review will demonstrate that “attribution” and “apportionment” are used interchangeably in atmospheric modeling literature. Therefore, the paragraph beginning on page 11, line 25 of the revised manuscript should not depend on the distinction of these two words. Rather, using “attribute” instead of “perform an apportionment of” would appropriately indicate that there is no distinction between the meaning of these two words. Also, it would keep intact the clarifying argument the authors make that they are not trying to attribute observed PM₁₀ concentrations but modeled concentrations. It is left to the editor to decide whether apportioning modeled concentrations is a valuable endeavor when they differ as much as these do from observations.

Accordingly, an extensive effort to clarify the nature of the work has helped tremendously in this revision of the manuscript.