**Atmospheric
Chemistry
and Physics
Discussions**

Interactive comment on "Estimates of global terrestrial isoprene emissions using MEGAN (Model of Emissions of Gases and Aerosols from Nature)" *by* A. Guenther et al.

A. Guenther et al.

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We greatly appreciate the constructive review provided by Bill Collins. We will address each of his comments in our revised manuscript.

Response to general comments: we agree with the need for a better description of the driving variables needed to run the model and will add a Table describing what is needed for various model options.

Response to specific comments: Page 114: Wind speed and humidity are used to determine leaf temperature- we will explain this in the text. U_star will be added to the list. We will explain our reasons for having different standard conditions in the revised

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text. We use above canopy conditions to specify standard conditions because we use whole canopy emission factors. The emission variations algorithms are applied to individual canopy components (i.e., sun and shade leaves at different canopy depths), not on the whole canopy scale, so we use leaf-level conditions.

Page 122: We will extend our explanation of the canopy model. A new table will be added to clarify the required input parameters.

Page 123: The differentiation between shade and sun leaves will be described in the revised text.

Page 124: Our reason for including the figure showing the whole canopy response to increasing LAI is to illustrate the total impact of LAI variations. This gives the reader some idea of how sensitive the model is to changes in LAI. We will explain this in the revised manuscript. We agree that it would be interesting to provide a more detailed analysis of the response of each component of the canopy environment model to various driving variables (i.e. the response of gamma_P to LAI. However, as the reviewers have pointed out, the manuscript is already quite lengthy so we will leave this to another manuscript.

Page 126: this is air temperature. We will clarify this in the revised manuscript.

Page 137: we will make the suggested changes in the revised manuscript.

Page 138: we agree that this is not surprising. It is not clear whether all of the other modeling studies did the same thing.

Page 144, paragraph 2: As is described in the manuscript, we simply used available climate model predictions of future PPFD. We do not know what caused the PPFD changes although we agree that it is an interesting question. However, it is one that should be addresses by the climate modelers and is beyond the scope of this manuscript.

Page 144, last paragraph: There is very good agreement between the various studies

that have investigated changes in isoprene emission in response to the weather of the past days to weeks, as well as studies of leaves developing under different light and temperature conditions. There is no question that this phenomenon occurs, although more work is needed to better characterize the algorithms. We will emphasize this, and the need for additional observations, in the revised manuscript.

Technical comments: We will make the suggested corrections.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 107, 2006.

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