

**RC:** I am very satisfied by the answers by the authors to my comments. However, the following comment (RC) and the response to it (AR) deserve further discussion.

**RC:** Page 11989, line 16 – page 11990, line 10. The fitting of the G06 algorithm to the flux data ignores the effect of light attenuation within canopy on the functional form of the PAR response. Thus I would refrain from adjusting the functional form of the algorithm based on this analysis even though the ecosystem scale base emission rates based on the flux data can be useful on modeling purposes.

**AR:** We would argue that because we are fitting the G06 algorithm to our directly measured fluxes the effect of light attenuation through the canopy has been fully captured by our measurements. Therefore the functional form we present is in fact representative of the canopy-scale response to PAR measured at the top of canopy.

**RC:** I have to disagree with this approach. The original algorithm for the light and temperature dependent isoprene emission by Guenther et al. (1991) is not purely empirical, but based on the light dependency of electron transport rate and temperature dependency of enzyme activity and we can argue that similar dependencies should exist for de novo monoterpene emission. This basis on the biological mechanisms is one of the reasons why this algorithm is so successful in describing the isoprene emissions from various ecosystems and even de novo monoterpene emission. Now, implicitly including the light attenuation to the algorithms would lead to two things. First, the applicability and generality of the algorithm would be reduced as all the parameters would need to be separately estimated for each ecosystem with different canopy structures and densities. Second, the algorithm would lose its basis on describing the biosynthesis of terpenoids and become a purely empirical one. Instead of the empirical approach suggested by the authors, I would much more like to see a model in which the biological synthesis (and emission) and light attenuation are treated separately. This would enable development of more process based parameterizations and thus more insight to the processes behind emissions.

**AR:** It is correct that our approach derives the parameterization for the canopy-scale flux, whereas the G06 algorithm is for the response of the emissions at the leaf scale. We have pointed out this difference more clearly in the revised manuscript. Because, many implementations of emission parameterizations do not use a multi-layer canopy environment model, but are big-leaf parameterizations, such revised parameterization is worth presenting.

In response to your comments we have now simulated the isoprene and monoterpene fluxes at this site using both the G06 algorithms and the parameterized canopy environment emission activity (PCEEA) algorithms, which is a simplified single-layer canopy-scale representation of the multi-layer model. This PCEEA version of MEGAN utilizes a different set of equations to approximate the canopy-level emission without having to use a detailed canopy environment model. While it accounts for the light penetration into the canopy (using information on the canopy structure such as LAI), the equations for the emissions themselves are slightly more simplistic than the G06 equations, i.e previous light and temperature is no longer accounted for. Overall, we found that the PCEEA gives a poorer fit to the observed fluxes when compared to just using the G06 algorithms. This in itself is interesting as it suggests that at this site it is perhaps more important to consider the previous light and temperature than to consider the canopy structure, at least if this is done in this simplified way. Obviously, coupling the leaf-level algorithm with a detailed canopy environment model may well result in a better model fit, however the implementation and validation of such a model would go well beyond the scope of the current paper as we would also need to validate the canopy environment model for this site. Nonetheless, it might be that our flux data are used, along with others, by a modeller to improve the generalised form of MEGAN in the future.

We have added a paragraph to the manuscript describing the above and we have also added a cautionary note to our fitted coefficients which states (a) that they describe the flux at the canopy scale, (b) are specific for this site and (c) they could only be applied to canopies with a similar structure.