

## ***Interactive comment on “Priming and substrate quality interactions in soil organic matter models”***

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We thank both reviewers and several colleagues for constructive comments on the manuscript.

Attached is a revised version and a figure supplement.

In the following the main changes to the manuscript are listed.

- An updated appendix A, describing the rationale of the derivations in more detail.
- New model variant AssimExplicit that includes more microbial detail.
- We introduced a new discussion paragraph and figure for the Microbial limitation

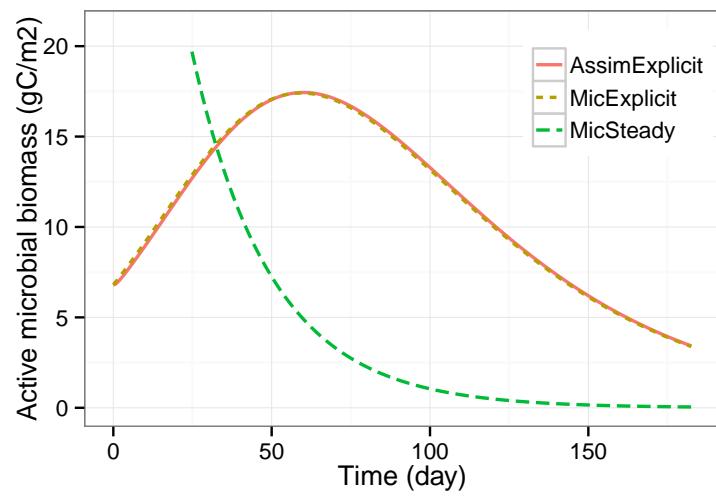
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factor (eq. 3). We argue that the presented equation should be used in other SOM dynamic models. Therefore we present a bit more detail on this.

- We introduced modification of decomposition rates by environmental conditions:  $l_{e,j}$ . These can be a function of model drivers that change over time. We redid the derivation of the simplified model variance accounting for this modification.
- A new paragraph on short term fluctuations of environmental conditions. These fluctuations are the main cause of rapid changes in decomposition flux. Hence they can cause violation of the assumption of active microbial biomass being near its predicted quasi steady state.
- An updated appendix B, referring to published works to justify the choice of scenarios and parameter constraints.
- In the LabPriming scenario we reduced the amount of amendment to the order of magnitude of microbial biomass, to yield a more realistic scenario. This does not change the main patterns or conclusions.
- Symbology changes: We excluded the subscript in microbial efficiency:  $\epsilon_F$  to  $\epsilon$ . Further, We replaced symbol of microbial limitation by  $l_A$  in order so that can be distinguished from 1 or I in the online version. Also the symbol of microbial turnover was replaced turnover  $\tau$  in order to distinguish it from time  $t$ .

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/9/C8460/2013/bgd-9-C8460-2013-supplement.pdf>



**Fig. 1.** LabPriming\_ActiveMicrobialBiomass

C8462