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Discussions

Interactive comment on "Simulating microbial degradation of organic matter in a simple porous system using the 3-D diffusion based model MOSAIC" *by* O. Monga et al.

Anonymous Referee #1

Received and published: 24 December 2013

Manuscript entitled "Simulating microbial degradation of organic matter in a simple porous system using the 3-D diffusion based model MOSAIC" provides a useful contribution to the subject of microbial degradation within porous media. Modeling of microbial processes in porous media is essential to improve our understanding of how physical, chemical, and biological processes are coupled in groundwater. The paper is well-written and the topic of this manuscript falls within the scope of the Biogeoscience. It reviews current state-of-the-art in an areas covered in article, that are, modeling of microbial processes and X-ray microtomography. Authors state the research problem, and provide description of methods, discussion of the results and conclusions. In my opinion paper can be published in the present state.

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Minor changes:

Abstract, page 15615, line 11

"without any parameters change" may be changed to "without changing any parameters"

Introduction, page 15615, lines 18-22

authors can rephrase this sentence into two sentences to make it easier to read "Indeed, soil microorganisms live in a complex network of pores, resulting from the three dimensional arrangement of soil solid particles, which is more or less filled with air and water, variously interconnected and in which microorganisms as well as organic resources are heterogeneously distributed spatially" —-> "Indeed, soil microorganisms live in a complex network of pores, resulting from the three dimensional arrangement of soil solid particles. This network is more or less filled with air and water, variously interconnected and in which microorganisms as well as organic resources are heterogeneously distributed spatially".

Introduction, page 15615, lines 21-22

change ". . . heterogeneously distributed spatially" to ". . . spatially heterogeneous"

Material and methods, 2.4 Simulating microbial decomposition by graph updating, page 15624, lines 11-12

change "We assumed that oxygen is not limiting factors of degradation because we are not near saturated" to "We assumed that oxygen is not limiting factor of degradation because we are not near saturation"

Results and discussion, 3.1 Simulation of sand structure and water content, page 15625, line 10

change ". . . used as the initial data of define the pore space. . ." to ". . . used as the initial data to define the pore space. . ."

Results and discussion, 3.2 Simulation of fructose mineralization in sand, page 15625, line 13

change "... mineralization at the high water content compare lower water..." to "... mineralization at the high water content comparing to lower water..."

Note to authors

It may be very useful to compare the results coming from modified (extended) MOSAIC II model with modified organic matter decomposition module to unmodified MOSAIC II model to see if the results are different and what is the importance of this change made in model.

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Interactive comment on Biogeosciences Discuss., 10, 15613, 2013.

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