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Interactive comment on "Modeling microbial exchanges between forms of soil nitrogen in contrasting ecosystems" *by* M. Pansu et al.

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General comments: This paper develops a coupled C-N model of microbially-driven decomposition and mineralization. The model is tested against data from an altitudinal gradient in Venezuela using different assumptions about the homeostasis of microbial biomass stoichiometry.

Overall, I appreciate the effort to develop a coupled model of microbial C-N dynamics, and to test the model against actual data in a quantitative data. However, I was not clear on the main point of the paper. The first two research questions seemed less important, since they focus on well established pathways of nitrogen cycling. Perhaps the rationale for these questions could be improved. Also, the discussion paragraphs on these questions are rather cursory. I am not clear on what new insights are being

gained, or why they are important.

The third question is about the homeostasis of microbial stoichiometry, and this question is relevant for understanding and modeling microbial N cycling. However, the ultimate conclusion seemed ambiguous. Constant stoichiometry fit the data at low elevation but not high elevation, yet the authors suggest that using constant values is probably OK in most situations (5765:21-22). Are there any more broad conclusions that can be drawn from this study about the appropriateness of using constant microbial C:N ratios in biogeochemical models? How might the predictions from this model apply to other systems aside from the Venezuelan elevation transect?

I would suggest that the authors revise their paper to focus more on a clear question with broad relevance that could be addressed by their model-data assimilation. From what's written now, I think the focus could be on question 3, but with more discussion of the broader implications of the model predictions. Otherwise I'm afraid this paper will have limited impact because the rationale and the applications of the study are unclear.

Specific comments: In the abstract, I would suggest a more direct presentation of the key results or predictions from the model.

5755:26- If this is an assumption, what is the benefit of posing question 1 in the intro?

Table 3: Is the value for kMB correct? It seems unlikely that nearly 50% of the microbial biomass would turn over every day.

Figures: Figures 2-7 are somewhat busy and hard to understand. On some of the panels, the y-axis does not extend far enough, and some of the data points and model predictions are cut off. I would suggest only including the best-fit model lines, rather than all of the model assumptions and strategies where appropriate. This would make the graphs less busy, and the statistics are already reported in Table 4.

Interactive comment on Biogeosciences Discuss., 10, 5749, 2013.