

Interactive comment on “Modelling dynamic interactions between soil structure and the storage and turnover of soil organic matter” by Katharina Hildegard Elisabeth Meurer et al.

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We would like to thank the referee for the perceptive comments and constructive suggestions for improving the paper. We will provide responses to all the comments at a later stage, but here we would like to write a few words about one of the points raised by the referee, namely the need to explain in more detail the advantages of our new model. We agree that a detailed discussion of the advantages of modelling interactions between soil structure and soil organic matter storage and turnover is warranted. We did write about this topic in the introduction, but only in rather general terms. We propose to include a more detailed summary of how we see the particular advantages of

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our modelling approach in the “Conclusions and perspectives” section. We did mention some of these advantages in our response to Thomas Wutzler (referee 1), which we can briefly repeat here. Our model will enable investigations of the effects of contrasting soil textures, tillage systems, and faunal bioturbation on soil organic matter turnover and storage. With respect to “the other side of the coin” (the effects of organic matter on structure), our model predicts changes in porosity and soil water retention, which enables straightforward links to models of soil hydrology and crop growth. This opens up the possibility to develop a soil-plant model that would encompass, for the first time, a complete dynamic description of all the physical feedback mechanisms in the carbon and water cycles that determine soil quality and organic carbon sequestration in soil.

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