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Interactive comment on "A global data set of soil hydraulic properties and sub-grid variability of soil water retention and hydraulic conductivity curves" *by* Carsten Montzka et al.

Anonymous Referee #2

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The problem of providing good soil parameters to LSMs is undoubtedly acute. The work is technically solid. Several conceptual aspects of the work have to be explicitly discussed. 1. The authors are estimating van Genuchten parameters. Does this mean that they are going to run the Richards equation for the spatial support scale of 40 x 40 km? Do they have any indications of the applicability of this model at this scale? If they do not then it would be prudent to state that and to outline the means of proving such applicability. 2. The authors base their estimates on the Rosetta PTF. They indicate that they plan to repeat this work for other PTFs such as Rawls-Brakensiek, HYPRES, etc. Why do they want to do that? How can a future user of their results decide which PTF should be used? The authors should either state that they will provide some

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guidance on PTF selection or refrain from producing several of conceptually equal but numerically different datasets. 3. Although the authors claim that they use the MIller-Miller scaling, they do not use it. They use the Warrick's scaling. The difference is that M-M scaling is formulated in terms of water contents, and the Warrick's scaling is formulated in terms of saturation degree, and this is what this paper is using. 4. The Miller-Miller scaling so far was demonstrated for relatively small spatial extents. It was shown for these small extents that the scaling multiplier is lognormally distributed. However this never was shown for the large extents. Therefore the use of the log-transform for scaling multiplier has to be either justified or discussed. 5. The authors propose to average the saturated hydraulic conductivity using log transform, essentially using the geometric mean. The saturated hydraulic conductivity is known to scale with the extent. Neither arithmetic nor geometric mean follow such scaling. The authors should justify or at least discuss the selection of the geometric mean.

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