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Hydrology and Earth System Sciences
Discussions

Interactive comment on "High-Resolution Virtual Catchment Simulations of the Subsurface-Land Surface-Atmosphere System" *by* Bernd Schalge et al.

Anonymous Referee #1

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This manuscript describes the numerical generation of a virtual reality (VR) of a subsurface-land surface – atmosphere system. The model system applied for generating the VR is the TerrSysMP platform coupling the COCMO meteorology, CLM land surface and ParFlow subsurface model. The required data are obtained from the Neckar catchment, however significant physical characteristics describing the watershed, such as the karstic properties of the limestone areas, are neglected here for simplicity. The generated VR is then compared to the boundary layer height, precipitation, and runoff measurements, as well as to spatially distributed soil moisture information from SMOS and SMAP sensors. The structure of the paper is rather clear as is the intention of the authors; they wish to provide a first reference publication in order to

then proceed to use this VR for future data assimilation exercises. However, while the structure and intention of the authors is clear, I have asked myself while reading the manuscript and preparing the review; "What have I actually learned from the paper?":

- The modelling platform and individual components have been used previously and were also tested and compared against real data elsewhere, so there are no general new insights, except maybe that is has not yet been done explicitly for the Neckar region before.

- The difficulties in relating microwave data to land surface soil moisture conditions is also well known and widely published.

- The dependency of ET to soil moisture availability and water table depth as outlined in section 4 is, in my opinion, basic soil physics material that is taught in every introductory course.

- The only surprising point for me, is how well the yearly precipitation amounts are actually covered.

In summary, I see the principle need and the desire for the authors to prepare for their next steps. However, I do not think that the current version of manuscript provides sufficient and substantial new information to potential readers to justify it as a "stand-alone" paper in HESS. I could anticipate some content of this manuscript in a very condensed form (and without losing any of the provided information) as a technical part of future more data-assimilation type papers. Therefore, in the present form I would suggest to reject the paper for publication in HESS.

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