

## ***Interactive comment on “Development and Analysis of Soil Water Infiltration Global Database” by Mehdi Rahmati et al.***

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Received and published: 25 March 2018

Through a global survey of availability of soil infiltration data, the main authors of this manuscript developed a general accessible global data base of some 5000+ infiltration data sets, with all those who submitted data recognized through co-authorship. The database includes additional supplemental data such as soil texture, SOM, bulk density, saturated hydraulic conductivity, EC and pH, and landuse, if available. All data were digitized, and subsequently fitted through analytical 1D or 3D analytical solutions, providing for fitted values of sorptivity (S) and saturated conductivity (Ksat). Subsequently, the paper analyzed and compared measured with fitted Ksat values, and used principal component analysis (PCA) to analyze and discuss possible relationships between soil properties with S and/or Ksat. However, as also stated by the authors, the

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performed analyses are limited and much more could have been done, but that was not their objective. Moreover, the authors emphasize the many uncertainties associated with the various measurements and model assumptions. Despite that, the manuscript highlights the potential uses of this database for future research, as well as the need to expand the database, as various world regions are under-represented.

In all, this reviewer was impressed with the commitment of the main authors to provide such a accessible global soil infiltration database. My main other comments are: 1. For those many readers that are likely not well-versed in soil infiltration, its limitations in measurement and modeling, it would be best if a literature reference was provided. I could give an example of that, but ask the authors to contact me, if they are interested. 2. Indeed, the main discussion is on data uncertainty, for example on the discrepancies between independently measured and fitted  $K_{sat}$  values, and the lack of correlation with soil texture. The authors provide various reasons, including the scale of measurement and differences between field-measured and lab-measured infiltration data. However, I would pose that much of that is related to the lack of including soil structural information, such as macro porosity quantification or other possible soil attributes. I think that this manuscript deserves such discussion, so readers are aware. Moreover, it could aspire others to collect such information when conducting additional soil infiltration measurements, and can include this in the database in the future.

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Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2018-11>, 2018.

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