Hydrology and Earth System Sciences Discussions

Interactive comment on "The Hydropedograph Toolbox and its application" *by* C. B. Graham and H. S. Lin

Anonymous Referee #3

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The paper present an assemblage of tools for exploring and visualizing some key soil hydrological parameters and processes using real-time soil moisture monitoring datasets. Tools include statistical summary, soil water release curve, preferential flow occurrence, hydraulic redistribution, and the relationship between soil moisture and soil temperature. Basically, this tool is able to analyse large quantities of data (mainly water content) at different depth and in different sites (no georeferenced spatial analysis tools are provided). Then authors employ this toolbox in a case study at the Shale Hills Critical Zone Observatory. My first comment deal with the title "The Hydropedograph Toolbox and its application"; I would argue that considering the content of the paper there is no real need for the word "pedo". In fact in the toolbox there is – unfortunately - no real reference to soil types and/or soil genetic/diagnostic horizons or

anything dealing with "pedology like" information (as it would be expected in hydrope-dology papers). Soil horizons are indeed quoted, but similarly to any soil water balance models...nothing more. As general statement, I understand, very much appreciate and support the idea behind the work as "...this initial version of the toolbox is not yet exhaustive, but envision it to be an open source program allowing for continuing expansion and incorporation of new methods and procedures". In fact, considering the increasing number of soil water monitoring sites in different part of the world, there is very much need of toolbox - freely available on the shelf - for the analysis of real time soil hydrology datasets (especially considering multidisciplinary teams). Despite this general positive statement the work show weakness to different perspectives. On the programming side, it does not shows algorithms, codes, technical framework of the software, etc. On the experimental side, propose data which seem to be already published (few self quotations). I really would encourage authors to propose their tool-box to journals more focused for this type of work (e.g. Journal of Hydroinformatics, Computers & Geosciences, Environmental Modelling & Software, etc.). As alternative, they should reinforce their contribution supplying original data for a new submission to HESS. For instance they could better combine, using data from their experimental site, hydrological processes (as observed by the toolbox) with a much stronger pedological perspective (which cannot be restricted to the only soil classification and quoting by-pass flow). Since other referees have already supplied many technical points...I may add only a couple of specific issues: (i) the application of Montecarlo simulation in the water retention curve is interesting but rather cryptic and it must be better explained; (ii) why water retention curve started at -30 kPa (-300 cm, field capacity)? Why plotting pressure head over standard linear scale and not logarithmic scale ? ...

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Interactive Discussion

Discussion Paper