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Hydrology and Earth System Sciences Discussions

Interactive comment on "Parameterization of bucket models for soil-vegetation-atmosphere modeling under seasonal climatic regimes" *by* N. Romano et al.

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Introduction

The manuscript presents a sensitivity analysis of the soil field capacity parameter in bucket models for Mediterranean, seasonal climate , using the Richards equation as reference. The topic is definitely within scope for HESS and previous literature is adequately cited.

General Comments

I agree with the referee comments of Guswa and Crosbie and my comments are along the same lines.

1. Time series of model results.

An essential part of the discussion is the 'memory' of the system. Fig. 5 and 6 only show summarizing info. It would insightful to include a few exemplary time series to illustrate the time need to wet or dry a soil.

2. Stochastic time series.

Rather than using a 100 simulations with stochastic rainfall, it would be advisable to run the simulation for a longer period (>10 years) with representative forcing of the Mediterranean region. This will not only avoid any debate on the aptitude of using the Poisson Rectangular Pulse, it will also enable to account for different initial conditions at the start of the regrowth vegetation phase. This will especially be important to assess the effect of multi-annual droughts

Minor Comments

- tables 2,3 and 4 can be merged into 1 table

- p5085l23: replace 'instead has' to 'instead one has'

- p5092l6: introduce space between 'where' and 'sw'

- p5097l27: Twarakavi et al. [2009] used data from Schaap et al. [2001] and Minasny et al. [2004], which only include soil samples from North America and Europe, no data from Australia

- p5101l20: replace 'leaching' with 'draining'

References

Schaap, M. G., F. J. Leij, and M. T. van Genuchten (2001), Rosetta: A computer program for estimating soil hydraulic parameters with hierarchical pedotransfer functions,

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Minasny, B., J. W. Hopmans, T. H. Harter, A. M. Tuli, S. O. Eching, and D. A. Denton (2004), Neural network prediction of soil hydraulic functions for alluvial soils using multi-step outflow data, Soil Sci. Soc. Am. J.,68, 417– 429.

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