

## REFEREE REPORT (HESS-2014-304)

**Title:** *Recharge estimation and soil moisture dynamics in a Mediterranean, semi-arid karst region*

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**MS No.:** hess-2014-304

**MS Type:** Research Article

In the revised manuscript, many aspects of the paper have been improved and clarified; however, the authors have not convincingly addressed some major revisions required, reported below.

1. The authors do not describe the hydrogeological conceptual model of the karstic perched aquifer, i.e. the conceptual model of aquifer recharge; these are two crucial and preliminary aspects for the reliability of the simulation and modeling results.
2. The geological cross section inserted in figure 1 is not clear given the absence of the hydrogeological map of the study area or hydrogeological conceptual model.
3. The profile section of Figure 1 and Figure 2 shows a typical morphology of an endorheic basin. If this is true, the authors should clarify whether the groundwater recharge of aquifer is only vertical-direct-diffuse infiltration through the soil and unsaturated zone (autogenic recharge) or also concentrated-secondary infiltration via shallow hole-point infiltration (allogenic recharge).
4. The Figure 7h is not consistent with the simulation of the percolation flow; during the period 10/10 - 4/11 groundwater levels variation are not justified by pumping and by percolation processes simulated.

In an attempt to try to clarify these points, I do recommend further review. Otherwise, the manuscript may be accepted at condition of eliminating both the cross section reported in Figure 1 and Figure 7h (and related comments in the main text).