

**Title:** Monitoring infiltration and subsurface stormflow in layered slope deposits with 3D ERT and hydrometric measurements – the capillary barrier effect as crucial factor

**Authors:** Rico Hübner, Thomas Günther, Katja Heller, Ursula Noell, and Arno Kleber

### **Comments**

The manuscript describes a field investigation on the infiltration process in a three layered 15° sloping deposit in the Eastern Ore Mountains. The authors aim at identifying the main characteristics of the water movement in the vadose zone on a hillslope, and in particular how the presence of soil layering affects the subsurface flow paths, during an irrigation experiment. A study area of about 2.5mx7m was monitored by means of Electrical Resistivity Tomography, able to produce high spatial and time resolution data, and of tensiometers, used to monitor matric suction at various depths and location and to validate the ERT model.

The research is very interesting, the paper is quite concise and well written and should eventually be published, even though I think that the following main shortcomings should be addressed.

- 1) As the readership of the HESS journal is multidisciplinary, I think that section 2.3 needs to be revised introducing the concept principles of the ERT technique and, on the other hand, trying to simplify it. Additionally, a clear indication of the accuracy and limits of the technique has to be given.
- 2) The deepest tensiometers were installed within the coarser soil layer LB2 which, following the grain size distribution illustrated in Fig. 1, consists in a gravel with cobble. It is well known that this kind of devices do not work properly in a very coarse soil as the water continuity through the ceramic cup and the water in the surrounding interparticle pores is not assured. How did the authors take into the account this effect?
- 3) Suction and resistivity measurements, as also indicated by the authors, seem to be not so in agreement for the first top-soil layer. Please, try to better explain the reasons. The resistivity profile in the uppermost part of the soil deposit assumes very low values: could it be due to a small amount of infiltrating water related to antecedent rainfalls?
- 4) The statement “this implies that the hydraulic.....” at page 12, lines 20-21, is not clear. Please, try to rephrase it.
- 5) Figure 2. Please check the legend and correct. Is the layer at 1.05m the LM2 (as indicated in the legend) or the LB-1? And the grain size distribution of soil at 1.3m is related to LB-1 or LB-2?
- 6) Figures 4 and 5. In order to make easier reading the graphs, and the relative comments in the text, it would be useful to indicate with a bold dashed line the nihil value of matric potential at the various depths.
- 7) Please, specify in the text what is the resistivity ratio illustrated in Figures 8 and 9.