

## ***Interactive comment on “Large-scale ERT surveys for investigating shallow regolith properties and architecture” by L. Gourdol et al.***

**Anonymous Referee #1**

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This is a well carried out and well documented study in which the sensitivity of ERT survey for a very specific geological structure was studied. The manuscript looks into a synthetic case as well as into an actual survey, where in both different electrode spacings were used to study the subsurface. This is a very nice example of experimental design (at least with respect to the synthetic case) However, other than putting in text several well known practices, I do not see here much usefulness for the research community. That is, the innovation in this manuscript is limited to the specific setup. While I cannot say that the authors made anything wrong here (other perhaps than not paying attention to measurement noise in their synthetic study), I also cannot see a reason to publish this manuscript. I may be missing something and this is why I ask for major revision (and not just recommend rejection), but in my opinion at best I can recommend

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restructuring this study into a technical note, likely in a different journal. In their revision (and in their answer to my review) I ask the authors to primarily, if that is possible, to highlight the innovation in the manuscript

Few more minor comments: 1. Was any noise used in the synthetic case? In both cases (if it was and if it was not) its effect should be included in the discussion 2. While the manuscript is well written, I do not understand why the authors insist on using the term "mathematical criteria". Isn't it trivial that this is math? Defining chi would be much better (not to mention using the Greek chi instead of the textual chi) 3. I'm having hard time understanding what the authors are trying to do in Figure 5, and then in Figure 9. It looks like a cumbersome way to explain that wider electrode separation "senses" deeper, but I may be misunderstanding

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-519>, 2018.

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