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Interactive comment on "Time-lapse cross-hole electrical resistivity tomography (CHERT) for monitoring seawater intrusion dynamics in a Mediterranean aquifer" *by* Andrea Palacios et al.

Anonymous Referee #2

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The topic addressed by the authors is interesting, the application concerns the monitoring seawater intrusion aquifer with electrical resistivity tomography. The special feature is long-term monitoring around two years. The main techniques used are the surface electrical resistivity tomography (ERT) method and Cross-Hole Electrical Resistivity Tomography (CHERT). Furthermore for the interpretation they made use of geological, rains and logs data. The authors maintain that the surface ERT loses the resolution in depth, this is true, however to identify large bodies as in this case, I don't think it is a problem of resolution but could be due to the array used and the amplitude of relative values to ERT. In any case in these situations if it is possible to perform cross-holes it is preferable with respect to surface investigations even if they lose the non-destructive

characteristic. However, there are disadvantages: -the data sensitivity is constrained to the region between the boreholes; - for vadose zone surveys, noise levels may be much higher than those using surface electrodes, owing to weaker electrical contacts (increased contact resistance). The authors have done a good job, the causes that define authors on long-term changes are very interesting. But they should investigate some things. In particular, information is lacking about the cross-hole electrode, the contact resistances between the electrodes and the walls, it would be interesting to have a comparison of the results from different arrays. It is not clear what happened to the data that gives 5800 data points but the data used for the inversion were 2677. I also have serious doubts about the resolution of CHERT because the distances between wells are very large between them. In this case the authors, if it were possible, should have done synthetic models with array different at different distances between wells.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2019-408, 2019.