

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-29

Anonymous Referee #1

Referee comment on "Effects of aquifer geometry on seawater intrusion in annulus segment island aquifers" by Zhaoyang Luo et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-29-RC1>, 2021

The manuscript investigates the impact of aquifer geometry on seawater intrusion in annulus shaped aquifer typical for islands using analytical solutions based on the Ghijben-Herzberg solution and hillslope-storage Boussinesq equation. The analytical solutions are validated by comparison with data from laboratory experiments, and then used to investigate the interface under different geometries (convergent, rectangular, divergent). The results are interesting and give some insight in the role of aquifer geometry on the seawater-freshwater interface. I have a few comments the aquifer as described in the following.

Comments:

line 145: "interface tip" and "tip location" should be defined.

line 168: The underlying assumptions should be clarified here.

Eq. (3): Different symbols ϕ should be used in the integrand and integration limit. What is ϕ in the upper integration limit?

Eq. (6): Some more explanation is required on how this equation is obtain and what are the assumptions.

line 292: The authors use the term "extent of seawater intrusion" repeatedly in the manuscript, but it is never defined. The authors should clearly quantitatively define, which are the diagnostics/observables that are used to assess aquifer vulnerability.