Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2021-586

Anonymous Referee #2

Referee comment on "Characterizing groundwater heat transport in a complex lowland aquifer using paleo-temperature reconstruction, satellite data, temperature–depth profiles, and numerical models" by Alberto Casillas-Trasvina et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-586-RC2, 2022

The paper by Casillas-Trasvina et al. aims to simulate the heat transport in the Neogene aquifer. Although this manuscript collects a lot of data, which can be useful for other works, it is difficult to read and the presentation should be more concise and to the point.

I have the following main comments:

1. It is not clear why the model needs paleo-temperature to work. Also, I really doubt that simulating 10519 years yields meaningful results, given that the flow model is stationary.

2. Peclet number: I have not understood why the Pe number is smaller than 1 in some parts of the aquifer. I really doubt that transport can be diffusive in aquifers.

Minor comments:

Ln. 85: a full stop is missing before This work.

Figure 2: Please write also in the caption the source of the map

Ln. 137: avoid abbreviation. Use was not instead of was't

Figure 3: the figure is not clear. It should be somehow indicated that b) is the inset in a).

Also the curves are not clear and the data from Eindhowen look completely missing.

Ln. 162: what is i.a. ?

Ln. 185: there is a parenthesis that is not open before.

Ln. 229: full stop missing after the parenthesis.

Eq. (1) and (2) vectors should be distinguished from scalar by using bold characters.

Ln. 336: which are cases 2 and 3?