

Interactive comment on “A Field Evidence Model: How to Predict Transport in a Heterogeneous Aquifers at Low Investigation Level?” by Alraune Zech et al.

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This article presents an approach re 'A hierarchical aquifer model which combines large-scale deterministic structures and simple stochastic approaches' in order to 'Predict Transport in a Heterogeneous Aquifers'

As it is a research paper we may expect this to be a novel approach. If the paper is extending similar earlier work then references should be made. If it is routine application of existing methods the paper should be called a case history.

The paper presented here shows neither a novel nor an original approach. The ap-

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proach presented was also earlier applied to the same site where the MADE project was conducted (Columbus Air Force Base, MS, USA)

The type of hierarchical deterministic/stochastic modelling of geological features and permeability distribution discussed in the paper, has been extensively used in the oil and gas industry since the mid 1980s. There is a vast body of literature on the methodology and applications. All this is completely ignored, ie. not referenced, in this paper. Plenty basic references (up to 1996) can be found in chapter 2 of ref 1 below.

This type of model is also not new for the Columbus Air Force Base area where the MADE experiment was conducted. I have personally published a PhD thesis and an article on a hierarchical deterministic/stochastic approach applied to tracer tests at Columbus Air Force Base (the site where the MADE experiment was conducted). The 4th listed author is well aware of all this, as he personally communicated with me, was reviewer of my PhD thesis (Ref 1 below), and attended conferences where papers were presented (eg. ref 2)

Given this, the authors should thoroughly re-study existing literature and reference some key papers out of the oil and gas industry. They also should make very clear that this is not a novel/original approach but simply a standard application of what has done before and is routine in oil and gas reservoir modelling. The authors should also make clear reference to similar work already conducted ~ 25 years ago at the same site (Columbus Air Force Base test site where the MADE experiment was conducted), eg. ref 2.

The only reason why the material could be published, is that it finally may point out the scientific confusion and structural research mis-management around the MADE experiment and stochastic hydrology. The MADE experiment has led to numerous publications in journals, which all ignored to account for geological heterogeneity in an appropriate manner and ignored other work that would not fit the premises of stochastic hydrology (macro dispersion theory).

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Ref 1 - Herweijer, J.C., 1997. Sedimentary heterogeneity and flow towards a well. Ph.D. dissertation, Free University, Amsterdam (https://www.hydrology.nl/images/docs/dutch/1997.01.07_Herweijer.pdf)

Ref 2 - Herweijer, J.C., 1996. Use of sedimentology and geostatistical modeling to estimate uncertainty of groundwater models. Proc. International Conference on Calibration and Reliability in Groundwater modeling (ModelCARE 96), Golden (CO, USA), September, 1996 (<https://pdfs.semanticscholar.org/a5a5/25d8da8091bb59a59795262d932f0b4a6333.pdf>)

Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2020-30/hess-2020-30-SC1-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2020-30>, 2020.