

## ***Interactive comment on “Interpretation of Multi-scale Permeability Data through an Information Theory Perspective” by Aronne Dell’Oca et al.***

### **Anonymous Referee #2**

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The authors use well-known information-theoretic quantities to quantify information content and information transfer among permeability datasets collected at different scales. The explanation of the quantities is thorough, but it is not clear to which extent the presented results are affected by the choice of the settings for the methodology (binning, bandwidth. . .) or how the information extracted from the datasets can be used in practice. I advise the authors to carefully review the manuscript, expanding the investigation to the analysis of the impact of “setting parameters” and presenting some ideas on the practicality of the analysis.

Specific comments - please investigate the role of binning with respect to the pre-

C1

sented results - how do you choose the bandwidth? Does it have an influence on the results? - does the fact that permeability is by its nature a process-dependent (or model-dependent) quantity affect the applicability of the procedure? - could you please discuss: - how often multi-scale permeability measurements are available - how the presented results are transferable - how the presented results can be used in practical applications - lines 85-86: please expand the literature review to include several works on the use of information-theory quantities for porous material characterization -lines 145-147: please clarify meaning and implications

Technical comments A few typos: line 284, line 254

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-628>, 2019.

C2