Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2020-91-RC1, 2020

Hydrology and Earth System Sciences
Discussions
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Interactive comment on "A new criterion for determining the representative elementary volume of translucent porous media and inner contaminant" *by* Ming Wu et al.

Anonymous Referee #1

Received and published: 24 June 2020

This paper presents a study of determining the REV of translucent porous media and inner contaminant based on two sand-box experiments. This paper is interesting, however, some details are missing. So I suggest "Major revision". My comments are as follows. (1) In the abstract, the new method of determining criterion should be pointed out clearly. (2) Light transmission techniques are very useful in two experiments. As shown in Eqs. (1)-(5), some parameters are important, but these parameters are not introduced in the following experiments and analysis. (3) In Lines 141-142, an assumption that the particles and pores are with lamellar structure is made. Further explanation and justification should be made for the reasonability of the assumption. (4) From Figure 7, the pattern of minimum REV sizes of porosity, sand density and torturosity is

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quite different. Further explanation should be given based the new criterion. (5) The innovative point of this paper lies in the proposed criterion of determining REV. Two experiments have been carried out to validate the accuracy and reasonability of the criteria. However, the applicability of this method still requires to be further validated and clarified, because two cases are not enough and scale effects exists. (6) The mean size of REV is made based on its relations with porosity, density and tortuosity. Other variables, such as pressure or saturation, can be served as an additional indicator? Minor comments: (1) In Line 14, what are “previous REV estimation”? (2) In Line 15, a new criterion should be clarified. (3) In Line 23, cannot ? (4) In Line 51-52, Fig.1c is cited before Fig.1a and 1b. (5) In Line 119, Table1 should be “Table 1”. (6) In Lines 217-218, the sub and sup i should be consistent. (7) In Line 552, volume? (8) In Table 1, how do you know permeability of the sand? (9) In Line 623, the subtitle of Fig.5a can be confusing, and it is suggested to replace porosity, density and tortuosity with other words.

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