

### Specific comments on HESS-2021-588

- When using scientific notation use  $10^n$  instead of  $E_n$ ). This can be noticed all along the manuscript, including in the figures and tables
- Please check if all the variables are listed in the notation list
- I suggest incorporating the author's reply to the first query of Reviewer #2 in the manuscript (in the Introduction or in section 2.2)
- Lines 24-25. Please rewrite this sentence and avoid repeating "mesh size"
- Line 24 and 49. I suggest using "...mercury injection technique..." instead of "... mercury injection experiment..."
- I strongly suggest not starting sentences with "And..." (e.g., Lines 181, 270, 278, 293, 312, 357, 428, 441, 528, 589)
- Line 129. Please use "five" instead of "5".
- Line 178. An "a" is missing between "permeable" and "stone" (unless the authors are referring the preparation of a sample in general; if so, "stones" should be used).
- Lines 180-183. Please revise these sentences. Saying that "Permeable stone is widely used in [...] ecological effect research" does not sound good
- Lines 183-185. This sentence is tremendously ambiguous, as "certain connected pore space" and "certain permeability" does not define what can, or cannot, be considered a "permeable stone"
- Line 188. I suggest starting a new paragraph with "We have carried out..."
- Lines 188-192. Please rewrite this sentence and avoid repeating "mesh size"
- Line 228 and 230. Eliminate "(m/d)" or use  $(m\ d^{-1})$  instead
- Lines 219-223 is repeated (see Lines 188-194)
- Line 232. I suggest starting a new sentence with "In fact, the transition..."
- Line 280. Please add a comma before "and the dipolar..."
- Line 323 (Figure 6). Please capitalize "Saturation" (Y-axis)
- Line 411 (Table 2). Please capitalize "Particle size" (header)

- Line 431 (Table 3). It is essential to repeat the “mean particle size” column also presented in Table 2?
- Lines 438-440. Please rewrite this sentence, which is too long and confusing
- Table 4. Use ( $s\ m^{-1}$ ) and ( $s^2\ m^{-2}$ )
- Lines 457-459. Please check this sentence
- Line 461. RMSE is well-known. It is unnecessary to explain it or present the equation
- Lines 473-476. Please separate into two sentences. The second sentence starts with the reference (Huang et al.)
- Line 525. Please check this figure’s caption as it sounds awkward
- Line 503-505. Please check this sentence
- Line 569. Please avoid repeating “In addition”
- Figures 15 and 16. These figures can be reduced without losing information
- Line 600. “The hydraulic gradient” is enough.
- Some units are missing in the notation list.