

Interactive comment on “On soil textural classifications and soil texture-based estimations” by Miguel Ángel Martín et al.

Miguel Ángel Martín et al.

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General response: We appreciate very much the overall positive opinion of this reviewer and specific comments that are helpful for the manuscript improvement.

Response to specific comments:

- **Comment from Referee:** The scientific methodology is sound and already published elsewhere, but I think it could be clearly outlined. It is difficult to follow the manuscript methods without reading preview papers from the author.

Author’s response: As the Reviewer suggests, we can clarify the description of the part of the methodology that is already published, i.e. the iterated function

C1

formalism.

Changes in Manuscript: The following text was included in the revised manuscript: “The set of textural data, together with the entropy self-similarity assumption, unequivocally determine the PSD (Martín and Taguas, 1998). Based on the theorem of Elton (Elton, 1987), the mass of soil with size particles within an interval J , may be computed using the IFS as follows: (a) take any starting value x_0 in I , (b) choose, at random, an integer number i of the index set 1, 2, 3, with probability p_i , and denote by x_1 the value $\varphi_i(x_0)$. Repeat the random experiment in (b), and suppose the new outcome is j , and set $x_2 = \varphi_j(x_1)$. If x_0, x_1, \dots, x_n is the sequence obtained in this way and m_n is the number of x_i ’s which fall in J , the ratio m_n/n , approaches the mass of the interval J as the number of iterations n goes to infinity. In practice, the estimation of mass in the interval J is achieved quickly.”

- **Comment from Referee:** 1) Abstract|line 4 and Conclusion| line 10 state that 6300 soil samples were used as experimental data, but the Materials and Methods section state that “. . . a total of 6240 soil samples were included. . .” (line 2 – page 3). Are authors rounding the number 6240? If so, it would be better to state something like around 6200 or circa 6200

Author’s response: We agree with the comment. The numbers should be the same throughout the manuscript.

Changes in Manuscript: The exact number 6240 will be used throughout the revised manuscript

- **Comment from Referee:** 2) The first phrase of Materials and Methods is identical to the one presented at Martín et al (2017a) -reference of the present manuscript. Is the intention stated the reason for the use of the dataset? The same reason as given in Martín et al (2017a)?

C2

Author's response: The first phrase of the "Materials and methods" section is not only identical to the one presented at Martin et al. (2017a), it also does not properly reflect the focus and objective of the work described in this manuscript

Changes in Manuscript: This phrase will be eliminated in the revised manuscript

- **Comment from Referee:** 3) Section 2.2 presents the formation of all possible triplets using seven fractions. Maybe authors could present a table with such triplets or point to table 3 where triplets are presented.

Author's response: We agree with the Referee's suggestion

Changes in Manuscript: A reference to all possible triplets, which are included in table 3, was included at the end of section 2.2

- **Comment from Referee:** 4) Section 3.1|from line 14 addresses table 1 results. The stated results are confusing. Are the standard triplets on the central column and 3-2-2 triplets on the right column? Is it the other way around? What is 5-1-1 triplet indicated on table 1?

Author's response: We agree with the Referee's suggestion

Changes in Manuscript: The second and the third columns in Table 1 will be swapped to prevent the confusion in the table explanation in the text.

Also, in the table, the name of the first column was changed from "'5-1-1' triplet" to "standard '5-1-1' triplet"

- **Comment from Referee:** 5) Discussion section|phrase on line 14 ("Rather . . .). Please rephrase it, because it is not clear.

Author's response: The sentence has been rephrased.

Changes in Manuscript: "Between reflected" has been changed to "reflected."

C3

- **Comment from Referee:** 6) Discussion section|phrase on line 19 ("The diameter. . ."). Is figure 2 supposed to illustrate what it is stated? I cannot see it in the figure.

Author's response: The caption in Fig. 2 had two errors.

Changes in Manuscript: The abbreviation "mkm" on the vertical axis has been changed to "%", and the same abbreviation at the horizontal axis has been changed to "mm".

- **Comment from Referee:** 7) Page 6|line 28. Reformulate because clearly there is something missing.

Author's response: We agree with the Referee's suggestion

Changes in Manuscript: Page 6|line 28 has been reformulated to: "When analyzing the utility of traditional sand-silt-clay triplet for classifying soils by their hydraulic properties, Twarakavi et al. (2010) concluded that "from a philosophical perspective, the research further stresses the need to revisit and reevaluate the results from the past in order to successfully move ahead into the future of soil physics". Using a set of fixed boundaries between texture fractions has been a productive approach in the past. Consideration of textural fraction boundaries as flexible parameters that can be task and dataset specific can provide additional insights on the role of texture in soil functioning and ecological services."

- **Comment from Referee:** 8) Figure 1 b) would benefit from putting 3-2-2 triplet on the caption.

Author's response: We agree with the Referee's suggestion

Changes in Manuscript: The '3-3-2' triplet is mentioned in the Fig. 1. caption before "(b)".

- **Comment from Referee:** 9) Table 2 - "being not different"?

C4

Author's response: We agree with the Referee's suggestion

Changes in Manuscript: The Table 2 title was reformulated to "Percentage of samples for which simulated and measured particle size distributions are not different at the 0.05 significance level."

- **Comment from Referee:** Attached PDF file with the minor misspellings found on the manuscript

Author's response: Thanks again for the thorough and constructive review.

Changes in Manuscript: All the misspellings were corrected.

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2017-84>, 2017.