Hydrology and
Earth System
Sciences
Discussions

Interactive comment on "Technical note: Uncertainty in multi-source partitioning using large tracer data sets" *by* Alicia Correa et al.

Anonymous Referee #2

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The technical note presented by Correa et al. details a method to estimate contributions from different sources to a mixture. The novelty of the work presented by the authors lies in the estimation of uncertainties of the different end member contributions. In addition to deriving the equations of the methodology, the authors also present a MATLAB Code that can be used to calculate the contributions of the different end members. I think the authors present a potentially valuable tool for the hydrologic community. However, I echo concerns regarding the readability of the technical note previously made by Bettina Schaefli and an anonymous referee. More details and explanations are required for this technical note to become beneficial to the community.

Major comments:

- The main problem with this technical note is the lack of definitions and explanations

of variables and notations. Albeit I understand that a technical note is supposed to be short, if the authors want this work to be utilized by other geoscientists and hydrologists, they need to improve the readability of the technical note.

- If I understand correctly, this technical note details the methodology used by Correa et al. (2019). It would be great if the authors could be more upfront about this in the technical note.

- The Matlab script is relatively hard to follow and understand, due to insufficient comments and documentation:

Naming of Matlab Files: Matlab filenames starting with a number cannot be run by Matlab. Please rename in order to avoid confusion for unexperienced Matlab users.

Name of csv file is different in repository than as used in matlab script (5_data.csv rather than data.csv). Please make consistent.

The Matlab Script is not very well documented. Neither the script directly, nor the readme pdf explain the actual inputs (only some cryptic A/B/C/D/M without explanations; one has to refer to Table 1 to understand the setup of the file) nor the outputs. Consequently, the script cannot be used without reading the manuscript in detail.

It would furthermore be helpful to reference the code lines to the equations of the manuscript and state in the script what each command is doing.

Please also reference the manuscript in the readme.pdf and the main script.

Specific Comments:

p.1 line 13: the grammar of this sentence is wrong/the sentence is incomplete.

p.1 lines 15-17: There is no connection between the two sentences, in spite of the "however". Sentence 1 talks about large tracer sets from four water sources (but says nothing about the number of tracers), Sentence 2 says the approach can be generalized to any number of tracers. Please make this clearer.

p.5 line 1-2: the reference of Taylor, 1982 should probably follow directly after "Taylor series approximation".

p.7 line 2: the specification of n=270 is no useful without also specifying the number of different streams sampled.

References: Correa et al, 2018, SciTotEnv should actually be Correa et al. 2019.

Table 1: Footnote: "three- axes". I believe this should be three-dimensional space.

Table 2: Some of the values provided here do not match up with those calculated by the MATLAB Code. Please verify.

Referenced Literature: Correa, A., Breuer, L., Crespo, P., Célleri, R., Feyen, J., Birkel, C., Silva, C. and Windhorst, D.: Spatially distributed hydro-chemical data with temporally high-resolution is needed to adequately assess the hydrological functioning of headwater catchments, Science of The Total Environment, 651, 1613–1626, doi:10.1016/j.scitotenv.2018.09.189, 2019.

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