Interactive comment on "Numerical issues of the Total Exchange Flow (TEF) analysis framework for quantifying estuarine circulation" *by* Marvin Lorenz et al.

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Thanks to the anonymous referees for their useful comments. We will go over each point in the following. The equations, pages and lines we refer to in our responses are from the revised manuscript. Supplement material: LaTeX difference of the original and the revised manuscript.

1   Referee 1

1) While the authors suggest that the "dividing salinity method" is preferred to the "sign method" but the former requires a algorithm to find extrema of Q. While they provide a detailed description of the algorithm they: "came up with", that particular working ("that we came up with") made me wonder if they feel there are shortcomings in this method. If so, please elaborate. If not, perhaps they could change the wording to something like..." We provide a detailed description of an algorithm to obtain extrema of Q which is required to determining the dividing salinity values" ...

In principle, any algorithm dedicated to finding extrema should be suitable for the first step of finding the extrema of Q. It is then important that the final extrema are alternating minima and maxima and to reduce the extrema to the relevant ones.

We don't see any shortcomings of using the provided algorithm as it should find any minimum and maximum by using the 3 point window. The key to lower the number of relevant extrema is the threshold transport which filters out the physically unimportant ones.

We agree to rephrase to: "We provide a detailed description of a robust algorithm to obtain extrema of Q which is required to determine the dividing salinities in Appendix B." (P16 L4f)

2) Section 4.1 line 25. "The bulk values change considerably", I assume they mean s, Q. While they do show more variability than the dividing salinity method, they only vary by a few percent. . . so referring to it as considerable change seems a bit severe. Also, shouldn't the bulk quantities be noted as Q_{in}, s_{in}, Q_{out} and s_{out}?

We just recognized that in the pdf provided by Ocean Science all labels from the pdf figures are not displayed correctly. In the original upload they are denoted by Q_{in} etc..

We rephrased to: "The bulk values still change with increasing N." and deleted "and causes the sign method to converge towards the absolute exchange values.", because we don't provide the absolute values.

3) The map does not include the indicating the locations of places mentioned in the text (Gotland Island, Gotland Basin, Bothnian Bay).

Indications are also lost due to the pdf error.

Please also note the supplement to this comment: https://www.ocean-sci-discuss.net/os-2018-147/os-2018-147-AC1-supplement.pdf

Interactive comment on Ocean Sci. Discuss., https://doi.org/10.5194/os-2018-147, 2019.