This comment is in response to anonymous reviewer 1 (RC1).
Thank you very much for taking the time to thoughtfully review our manuscript. We have worked to carefully consider all of your proposed suggestions and revisions. Below we will give responses to the specific questions.

This paper provided a signal processing approach for estimating path length and sediment transport from DoDs. This topoic is intresting and suible for ESurf. However, there are several substantial issues.
First, the reasearch gaps are not clear in the Introdution section. More literatures should be reviewed. For example, signal processing approaches is the main method of this paper, but it is not reviewed in the introduction section. Why should we need the signal processing approaches? Is other method also OK? namely, what is the necessarity of this approach. In fact, the signal processing approaches, such EMD method, are already applied in geoscience (e.g. DOI: 10.1111/tgis.12512).

Author's response- We have expanded the introduction to highlight the gaps we are trying to fill as well as explain the justification and rationale for using the signal processing method. (See extensive changes to the introduction and Sect. 2.1 Path length).

Second, the review of the morphological method is incomplete. The morphological method including 1D and 2D approaches is widely used for infering sediment transport (DOI: 10.1002/esp.483; DOI: 10.1002/esp.4633; DOI: 10.1002/esp.5094; doi.org/10.1016/j.catena.2022.106244). With these method, infering sediment pathway is easy. Although they did not estimate the path length, their methods have the potentaility for path length.

Author's response- We agree that these are important studies to include and have expanded the introduction to include some of these articles and much more literature on applications of the morphological method. (See introduction section, extensive changes, ex. Lines 27-37 and 103-119).

I suggest to re-orginize the Introduction, and review more relative literature.
Third, the methodology is not rigorous.
1. The manual measurement of the spacing is with huge uncertainty.
2.the center to center measurement seems OK, but, notably, the path length may be false. Besides the nearst patche of deposition to erosion patches, the volum of deposition and erosion pathes must be considered. If the volum of deposition greater than the volum of erosion, the sediment will be further transported to downstream patches; and thus the path length is not the nearest spacing of erosion and deposition patches.

Author's response- This is a good point and we have noted that this might be what is happening at the two higher discharges. We have included these limitations in the explanation of the manual method (lines 144-146). We have expanded the discussion to include a discussion of the vectors of erosion and deposition separately as well as the net and how they may be out of balance (lines 361-375 Fig. A1)

3. How do you determine the direction and size of the "bins" (L107). It is important because this affects the sum of the DoD matrix, and then influence the results. Moreover, the effect of direction and size of the bins should be disscussed.

Author's response- We agree and have expanded the methods section to discuss bin size selection (see lines 171-178 and lines 503 in the discussion).

Fourth, the figures should be improved. For example, Fig.2 a lack of legend. Fig.3 the IMF5 lack of axis.

Author's response- Thank you for pointing this out. We have now fixed the figures.

Finally, this paper segemented DoD into bins. Then, it is a 1D method in fact. with the 2D methods for sediment routing were already developed. Why not try the 2D methods. the 2D sediment tranport path length should be more correct than the 1D path length.

Author's response- Thank you for this suggestion. It would have been interesting to explore this aspect. However, in the case of our study, it seems slightly out of the scope because our goal was to create a method to define a characteristic path length to be used in sediment transport calculations solely from the DoD. The 2D approaches are useful but they also require either hydrologic data or estimates that are not always available. We think our method is an alternative to 2D methods when hydrologic data is not available or desired.