2nd Review: Investigating the celerity of propagation for small perturbations and dispersive sediment aggradation under a supercritical flow

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General comments

Thank you for addressing my previous comments. I can clearly see that the article has improved significantly in its presentation, explanations, analysis, and discussion compared to the previous version. I appreciate the detailed manner in which my concerns were addressed. At this point, I only have a few minor comments that I believe are important to address before this paper is published.

Detailed comments:

1) I believe that associating celerity with eigenvalues is an excellent approach. However, for readers who are not entirely familiar with these concepts, I suggest including a schematic figure or cartoon that illustrates what the celerity of the bed surface represents. This should be Figure 1, as it would help all readers understand the phenomenon you are describing. I recommend showing a front moving downstream; even though this is more representative of subcritical conditions, it would provide a contextual framework for the entire paper.

2) Abstract – Line 25: "Scatter plots indicate..." As mentioned in the first review, plots are tools used to analyze data, but they don't "indicate" something on their own. Rather, it is your interpretation of the plots that indicates a process. Consider revising this wording to more accurately reflect the relationship between data visualization and analysis.

3) Line 69: "prior investigations..." This sentence appears to be missing the word "only" to properly convey your intended meaning.

4) Line 125: The text mentions that Equation 1 is valid for a unit-width rectangular channel. While this is correct, this limitation—specifically the rectangular channel assumption—should be placed in context in the introduction and acknowledged there as well. As the article is currently presented, there is no mention of this constraint earlier in the paper. Furthermore, since engineering applications are mentioned in the abstract, it's important to note that natural channels may differ significantly from rectangular channels, which could affect the applicability of the findings.

5) "water ripples, mentioned above, ..." This reference is incorrect, as the discussion of water ripples appears in another section, not "above" this point in the text. Please modify

this reference to accurately direct the reader to the appropriate section where the simple cases are discussed.

6) Line 178: "This finding is somehow consistent..." This statement is vague and imprecise. The authors should explicitly state in what specific ways the findings are consistent with previous research or expectations, rather than using the ambiguous term "somehow." Clear articulation of the relationship between current and previous findings would strengthen this discussion.

7) Line 261: "... under the assumption of uniform flow..." I question the validity of this assumption in the context of supercritical flow with rapidly varying bed elevation. This potential limitation should be explicitly discussed in the paper, as non-uniform flow conditions may significantly affect the applicability of the presented analysis in such dynamic environments.

8) Figure 2: Changes in water depth along the channel clearly shown in this figure demonstrate that this is not uniform flow. Please discuss the potential errors associated with the uniform flow assumption and provide appropriate justification for its use despite this visual evidence to the contrary. An assessment of how these errors might impact your results and conclusions would strengthen the validity of your analysis.

9) "as equal to 1 s and 1.8 cm..." Please explain how these specific values were determined or selected, and clarify what they represent in the context of your analysis. Providing the rationale behind these parameter choices would enhance the reproducibility of your study and help readers better understand your methodological approach.

10) Line 367: "For the sake of ... of Fig 5 and 6" This sentence referencing Figure 4 is out of place and interrupts the flow of the paragraph. Please move it to where it logically belongs in the text to maintain coherence in your discussion.

11) Conclusion – Line 482: "(iv) The celerity..." Is this value (10^{-2} times the water velocity) the "rule of thumb" mentioned in the abstract? The origin of this value should be clearly explained. If I missed the derivation in the paper, please ensure it is explicitly presented, as this represents the engineering application mentioned in the abstract and would be particularly valuable for practitioners. This practical insight should be well-substantiated and clearly communicated given its prominence in the abstract.