

Interactive comment on “Numerical and remote techniques for operational beach management under storm group forcing” by Verónica Morales-Márquez et al.

Anonymous Referee #4

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The paper " Numerical and remote techniques for operational beach management under storm group forcing" attempts to describe the morphodynamic response of a microtidal beach under a storm group. The methodology incorporates a wide range of complementary methods to access beach morphodynamics and includes both cross-shore and alongshore components.

The paper is interesting and deals with a topic of great importance and clearly within the scope of Nat. Hazards Earth Syst. Sci. Nevertheless, I have some critical comments that should be addressed: (1) definition of manuscript objectives needs to be improved; (2) model application should be more clearly explained; (3) validation methodology

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should be greatly developed, and (4) the work novelty needs to be highlighted.

1) The second objective stated in the paper “secondly to present a multiplatform approach to help beach managers to make an insight-driven decisions concerning beach erosion management through the use of the data available in the beach and the operational run of numerical models” is unintelligible. Moreover, in the present state of model/platform? development, its application to coastal management is still very unlikely. In this sense, sentences like “This allows a correct management of the beach avoiding unnecessary engineering works between touristic seasons.” seems out of scope.

2) Description of model application should be sufficient clear to allow other researches to replicate the work and several methodological decisions require demonstration. For example:

- how were waves propagated from the AWAC to the offshore boundary of Xbeach? With 10 s waves it is expect that alongshore forcing was not uniform along the Xbeach offshore boundary – how was this accounted for?

- Figure 1 (source and date of the image is missing) and other images at the internet suggests the existence of a rocky platform. Is this considered in the modelling approach? The figure should include bathymetric contours and the nature of the bottom (is case of the existence of a rocky bottom).

- How was the closure depth computed? How far from the shore is it located?

- Bathymetry inversion of the timestack used linear shallow water approximation in the breaker zone? Most works that have dealt with this problem showed that this approach does not give good results.

- Why the authors did not use intermediate depth approximation at larger depths? This would avoid the problem stated by the authors that “The largest differences tend to be located at deep profile positions where the model is known to perform worse since the

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accepted assumption on Eq. (1) only is valid for shallow waters”.

- What is the line represented in figure 8? In this figure, the higher erosion values onshore (red pixels) seem to be connected with areas with no erosion (white pixels) suggestion therefore the generation of a beach scarp? Is this true? This feature was also observed on video images?

3) In my opinion, the validation methodology presented is the weakest element of the work. In fact, the presented information is very scarce and the approximation unconventional. The use of standard error parameters is strongly suggested (see for example Roelvink et al. 2009). At least one figure with the comparison of estimated and measured data across a profile is also needed. Without that the reader cannot properly access results reliability and therefore can be skeptical about paper conclusions.

4) Introduction is too large, and novelty of the work is not properly stressed. The introduction should also be more focused on paper objectives.

Paper would also benefit from extensive editing work as a number of inaccuracies were detected that should be corrected by the authors (some examples are given below).

-Abstract is very confusing and only describes the results and some conclusions; the abstract should be a shorth summary of the entire work: motivation, objectives, methods, results and conclusions.

-Authors should make correct use of significant figures.

-Storm group should be clearly defined – the storm wave threshold is relative to off-shore conditions and is independent of wave direction?

-Pg 1 - l14 – “all temporal scales” – specify – this includes thousands of years?

-Pg 2 – l2 – “0.01 % of land surface? How was this figure computed? What is beach definition? It includes the submarine domain? the gross domestic product is produced by beaches?

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-Pg 2 – l6 what is “RTK and echosounding surveys”?

-Pg. 2 – l12 – how was the beach area computed? Emerged? Above some datum? Up to the close depth? When the authors say “bottom colonized by the endemic *Posidonia oceanica* meadow at depths from 6 to 35 m”, this is also referring to the beach? The beach does not end at closure depth?

-Pg 7 –l9 - the AWAC measured the “JONSWAP spectra”?

-Modelling domain should be display in figure 1.

-A bathymetric map is missing.

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