

Review of **The sagging shape of shoreline formed on downdrift side of the structures due to seasonal oblique wave incidence**

by Lim et al

November 2021

Authors present a method based on the parabolic static equilibrium beach to estimate the main dimensions of the expected shoreline indentation downdrift groins. The method is then compared against numerical model results and applied to a beach in Korea. The manuscript addresses a topic covered by Earth Surface Dynamics and, in this sense, the manuscript can be of interest for many ESurfD readers.

In what follows, some observations/comments/suggestions are given.

General comments

[1] The manuscript needs a thorough revision of the **English language**. Grammatical errors (and unusual sentence constructions) are very frequent throughout the manuscript and will not be indicated here except in selected cases.

[2] The **title** is long and confusing. Please make it simpler. "Sagging shape" is not usually employed in the context of the topic, it is usually referred as shoreline indentation or erosion.

[3] Throughout the manuscript you mix data, methods and results in the same sections. This is a bit confusing for readers. Please re-organise the manuscript to include the following sections and restrict the content to the parts corresponding to the heading:

- (i) **Study area and data** where you describe the study site characteristics and present *all data* to be used;
- (ii) **Methodology** where you present and describe *all methodology* used in the study;
- (iii) **Results** where *all results* are presented;
- (iv) **Discussion**, where you discuss the obtained results and the applicability of the presented approach/model; and
- (v) **Conclusions**.

[4] Description of methods. At its present version, some of the text included in the description of the methods is "excessive". For instance, most of text describing the longshore sediment transport formula can be just simplified in a single line stating which is the formula to be used plus the formula itself. Most of this text can be found in any textbook. Please revise and simplify when possible.

In some cases, you provide more information than strictly needed. For instance, in section 6 the text from line 294 to 303 can be summarise in something like "shoreline positions were derived from time-averaged video images by using the method proposed by X". Equation 22 is not needed.

[5] Introduction

In this section you mix a series of concepts related to shoreline development. However, it is not clear why you do it. It would be better for readers if you clearly motivate your study.

[Lines 61-65] Please, reformulate the paragraph and include a sentence where you explicitly state the objective of the paper. Something like “The main aim of this work is

[lines 147 – 152 & Fig 7] How did you calculate H_b ? How did you obtain α_b ?

[lines 204-205] Define L (groin spacing / bay length)

[line 208] *parallel shoreline approximation* of Hsu & Evans?

[lines 252-253] *If you are going to propose an alternative expression for LST in the diffraction zone you have to consider not only changes in the wave angle, as you do in equation (21), but you should also include a term to account for currents induced by the wave height gradient occurring in the diffraction zone (e.g. Osaza & Brampton’1980 approach).*

[line 263] why is $\alpha_b=10$ the most appropriate angle?

[lines 266-267] Fig 16 does not indicate any agreement with field observations. Fig 16 just shows shoreline evolution as predicted by the model.

[line 269] I think that the $x_c = -32.5$ is wrong, probably you refer to another thing and not to x_c .

[line 274] Fig 17 is only a map where the location of AWAC is shown. It does not provide any crucial information (it should be enough to say that wave data were recorded by an AWAC system southward of the study area).

[lines 277-281] Can you explain better what did you do? What do you refer with average shoreline? Which diffraction model?

[lines 307-313] Here you are comparing nearly instantaneous critical points detected from hourly/daily video observations with predictions done for average seasonal conditions. Is this consistent to say that data agree?

[line 324] subscript -> superscript

Discussion

Here, you don't formally discuss your work (neither the shortcomings of the methodology or the results obtained). You should include here the advantages and disadvantages of the method. Why am I going to use your approach?

Conclusions

This section is too large (it is larger than the *Discussion* section). It is more a summary than conclusions.

Figures

Figure 2. please mark the location of the study site in the photo of Korea.

Figure 10 and **table 1** are providing the same info. Also, they have been obtained by applying equation 9 to selected θ values. You could remove them (figure and table) without affecting the understanding of the text. In any case, please remove at least one of them (table or figure).

Figure 19 is not strictly needed.