PAPER REVIEW

X-band COSMO-SkyMed© SAR data for sea wave simulations and coastal vulnerability assessment

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Title:

It can be considered appropriate. However, it is my opinion that to describe the contents of the paper for the potential reader and for indexing, abstracting, etc, it could be something as: *Sea waves modeling with X-band COSMO-SkyMed© SAR derived wind field forcing and applications in coastal vulnerability assessment*.

Abstract:

The abstract does not accurately reflect the content of the contribution. It is very long and no concise. It must state directly and informatively what has been found, including a general statement of the used methodology.

1 Introduction:

The introduction should state why the explored issue is of interest, what is known about it and what we do to improve the knowledge about the subject.

The initial part of the introduction, concerning the role of the atmosphere-ocean coupled interaction is a well-known fact and it can be reduced to a few sentences indicating the importance of the air-sea interactions on different time and spatial scales, in particular for the generation of wind waves.

The expression wind-wave interaction modeling is not correct in this context (lines 3 and 5, page 3284). The authors are using wind-wave models (wind-wave numerical models or just wave models).

The authors dedicate a large part of the introduction to explain various aspects of the most widely used third generation wave models, WAM and WAVEWATCH III. This part should be reduced and the interested reader should be lead to specialized literature cited in the paper.

In contrast, extension of comments on the coastal vulnerability assessment is more adequate.

Introduction is not the place to describe data sets or methods used in the paper. Lines (8-24 of page 3286) concerning SAR data and WAM model should be eliminated or combined with contents in the data sets and methodology contents.

¿What is the meaning of: *tidal events*?. (lines 22-23).

The purpose of the article is not explicitly and clearly stated. In fact, it is hidden in the introduction among data set and methodological aspects description. Even, at the beginning of the experimental results section.

2 Data set

Contents of data set section should be combined with those included in the introduction and improved.

It is a well-known fact that results from wave numerical models simulations depend critically on the quality of the driving wind fields. It has been shown by various authors that uncertainties in the wind field have a large impact on estimated wave conditions. In example:

Teixeira, J., Abreu, M., Soares, C., 1995. Uncertainty of ocean wave hindcasts due to wind modelling. J. Offshore Mech. Arct. Eng. 117, 294–297.

Holthuijsen, L., Booji, N., Bertotti, L., 1996. The propagation of wind errors through ocean wave hindcasts. J. Offshore Mech. Arct. Eng. 118, 184–189.

Among others.

However, uncertainty of wind fields derived from SAR images is not discussed.

3 Methodology

3.2 SWAN model

The term *S* in equation (2) is not the difference between the inner and the outer energy for the spectrum. It is the source function representing the sum of wave energy input from wind, energy dissipation by wave breaking and the energy redistribution of energy via non-linear interaction between frequency components.

4 Experimental results

Why including the objectives of the paper at the beginning of this section?.

The term wind-wave ~~oceanographic~~ modeling is redundant. Please, use wind-wave modeling.

4.1 SAR wind field retrival

Text from line 5 to 21 (page 3297) concern methodology. These are no results of the research.

5 Conclusions

The conclusions of the research are not accurately stated.

The contents of this section are not exactly conclusions. There is a mixture of conclusions and many other aspects, such as comments on the used data set which should be removed. Also points from line 11 to 23 should be removed

GENERAL COMMENTS:

The paper includes enough new content of broad interest in the ocean sciences field and is suitable for the journal.

So, my recommendation is that the paper can be accepted with moderate revisions, including restructuring and/or reviewing some parts of the text, but can be achieved without new information, except the comments concerning the uncertainty of wind fields derived from SAR images.