

Interactive comment on “Predicting Ocean Waves along the U.S. East Coast During Energetic Winter Storms: sensitivity to Whitecapping parameterizations” by Mohammad Nabi Allahdadi et al.

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Dear Reviewer

Thank you very much for your time reviewing our paper and for your constructive comments. Your comments for revision of the paper are addressed below:

#51: the author mentioned that Komen method tends to underestimate in different regions. The author should be specific about these regions. Are these regions are shallow water, deep water? Also, at least two references should be added to this part.

C1

The underestimation associated with the Komen-type whitecapping models occurred in both deep and shallow water regions. Examples of this behavior are presented by several studies, for example, van Vledder (2016), Allahdadi et al(2017), and Siadatmousavi et al(20111). These details will be included in the modified manuscript.

#63: Some more findings from Mulligan et al., (2008) and W007 must be mentioned

More details from these two papers that evaluated Komen and Westhuysen whitecapping formulas over both closed and marginal seas will be added to the revised manuscript.

#77: Did the author observe such this variability in their wind data, if so, how much?

The mentioned variabilities in wind speed and direction (gustiness) occur within short time slots (seconds to minutes) that cannot be considered by atmospheric models with hourly to several hourly outputs (Abdallah and Cavaleri (2002)). In our simulation, we used the CFSR wind field with 1-hour temporal resolution that cannot include such short-term variations. We will mention it in the revised manuscript. We mentioned the gustiness as an example for a shortcoming of the traditional whitecapping models, but including this effect was not a part of our study scope.

general comment: be consistent with swell and swell waves.

We believe that swell wave is a redundant expression. We will consistently use swell in the revised manuscript.

#146: In Figure 1, label the locations of places they mention in the text. Such a Gulf of Main, Rhode Island, and others.

The labels will be included in Figure 1 in the revised manuscript

#146: how much variation? any idea?

This sentences about the amount of seasonal variations of wind will be added to the revised manuscript: “For example during January 2009, the average wind direction

C2

along and off the U.S East Coast was northwesterly to westerly with average wind speed of 6.5 m/s, while for July 2009 average wind direction was southwesterly with an average wind speed of 3.5 m/s.”

#168: provide the results for CFSR evaluation. Such as R2 or RMSE, or others. Support your evaluation results in providing other references other than the mentioned one.

The evaluation results along with the statistical parameter will be included in the revised manuscript. Additional reference will be added to support the results.

#191: wave height? Do you mean significant wave height? be more specific.

Yes, this is significant wave height. Will be modified in the text.

#201: you don't need to put these references.

The references will be removed

In Figure 5 and 6: explain what those are black and red lines (regression line and 1:1 line) in the captions. Figure captions will be modified to include definitions for the 1:1 line and regression line.

#Again, label Florida and Massachusetts coast on Figure 1 Labels will be added to the figure. #228: Could you provide any references that support the averaging method could minimize the noises?

Time-averaging of the spectra has been suggested by van der Westhuysen et al (2007) that will be mentioned in the revised manuscript.

#270: Show the location of very northeast edge on the map and explain about the wind condition during the simulation period on this location.

The location of “very northeast edge” will be marked on the map. Wind condition at this location will be discussed based on the snapshots in Figure 3

#314: state the default values.

C3

For the saturated-based mode the defaults for the whitecapping parameter the saturation threshold are $Cds=5.0 \times 10^{-5}$ and $Br=1.75 \times 10^{-3}$, respectively. For Komen, the default for the whitecapping parameter is $Cds=2.35 \times 10^{-5}$. These vales will be included in the revised manuscript.

#374: supply this paragraph with appropriate references.

The appropriate reference for this paragraph (Hasselmann et al.(1973)) will be included in the revised manuscript .n

#406: remove the space between 12 and d. And be consistent about the figure's captions (e.g., Figure 10 or Figure10)

Modifications will be applied to the revised manuscript.

#Add a few lines (2 or 3lines) discussing if the mentioned results considering these two approaches are applicable for other seasons since the authors only performed the sensitivity test for the winter.

The likely different behaviors of models during the summer with more occurrence of Atlantic swells have been mentioned in the last paragraph of Summary and Conclusion (486-490) of the original submission.

Regards Allahdadi et al

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