EGUsphere, referee comment RC2
https://doi.org/10.5194/egusphere-2022-847-RC2, 2022

Reply on RC1

Anonymous Referee #2

Referee comment on "Joint probability analysis of storm surge and wave caused by tropical cyclone for the estimation of protection standard: a case study on the eastern coast of the Leizhou Peninsula and Hainan Island of China" by Zhang Haixia et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-847-RC2, 2022

Title: Joint probability analysis of storm surge and wave caused by tropical cyclone for the estimation of protection standard: a case study on the eastern coast of the Leizhou Peninsula and Hainan Island of China

Authors: Zhang Haixia, Cheng Meng and Fang Waihua

The manuscript describes the analysis of the joint probability of storm surge and the significant wave height caused by tropical cyclones. The analysis was applied to a specific case study (Eastern coast of the Leizhou Penisula and Hainan Island of China).

Although the approach can be interesting, the paper presents several shortcomings related both to the methodology and to the presentation of results. The approach adopted for the description of the analysis is not very detailed. In particular, the description of the numerical models does not allow for an adequate understanding of their performance and the reliability of the results. More details about the setup of the numerical models and the validation result should be provided. Moreover, there is a lack of physical explanation of the phenomena simulated and related results.

Overall, the paper, although interesting, cannot be published in its present form.

Specific comments

How many tropical cyclones were used in this study? (line 95: 87, line 109: 119, line 119:

102).

To understand the result of the numerical models, the authors should provide a depth map of the study area.

The authors do not provide the criteria adopted for the generation of the unstructured grid. Were there any convergence tests?

How were the boundary conditions of the numerical models set?

Which are the governing equations of the two models? Why were these models selected?

Provide more details about the validation of the numerical results (station location, comparison of the storm surge and the significant wave height, performance parameters, etc.).

Figure 4. On the East side of Hainan Island, the surge height increased considerably. Is there some physical explanation for such phenomena?

Figure 5: The significant wave height is very high in the offshore region. Is there some physical explanation for such phenomena? It is suggested to consider the effect of the wave breaking.

It would seem that the effect of the sea level rising due to storm surge was not considered in the numerical simulation conducted with SWAN. If this is true, in the intermedia and shallow water the results are likely to be unreliable.

Minor point

Figure 1. Add the location of stations used for the validation of the models.

Triangular network -> triangular grid.

Table 1. Add the definitions of u and v.