Responses to Reviewer's Comments

We appreciate very much the constructive comments and suggestions of the reviewers, and have revised the manuscript accordingly. In the following, we explain our response to each comment of the reviewers. All revisions are highlighted with red color in the marked manuscript.

Comments:

Within the scope of the reviewer's cognition, although many have been reported considering establishment of wave forecast/hindcast platforms for regional marine systems, the fundamental methods with regard to the semi-empirical equations in describing the complex physical processes have not been developed or updated in a long time. For example, the latest update for describing the wind-input source of waves in one of the most populated phase-averaged model, SWAN, should be the formulas proposed ten years ago (Rogers et al., 2012). In the same year, Dr. Maintaine Olabarrieta and Dr. Jonh Warner's group have compared several formulas for ocean roughness on their performance of simulating hurricanes induced sea-states (including storm surges, wave heights and wind intensity) based on the coupled-ocean-atmosphere-wave-sediment system (COAWST). These formulas are dated back to early 21th century. In a more recent report proposed by Dr. Sheng Jing-Yu on the conference of ISSF 2021, they further compared and updated the formulas for capturing white-capping and wave-induced dissipation in COASWST model with a focus on the wave-current interaction during hurricane events. Whilst their updates were mainly established on the Taylor and Yelland's formula (2001). Nevertheless, few model could be capable for simulating wave height well in both shallow waters and deep ocean by using the same option for one wave physical process. By coupling AWBLM model and WWIII, the authors show us the capability of the system in wave hindcasting for both nearshore and offshore, which alone is worth publishing.

Response:

First, we would like to express our sincere thanks to the reviewer for his/her positive comment on the theoretical value of this study.

The reviewer deems that although many figures presented in the article aims at proving the model's advantages, the way for visualization needs to be improved so that the outperformance of the coupled system over the pioneer ones can be more observable. For example, how about using a matrix for model skill comparison for the varied variables (wave height, wave length, wave age)? Or using some maps for comparing the wave fields for different runs at the critical time snaps like the ones shown in Olabarrieta et al. (2012, Ocean Modelling), covering the entire Gulf of Mexico?

References:

Olabarrieta M., JC Warner et al. Ocean–atmosphere dynamics during Hurricane Ida and Nor'Ida: An application of the coupled ocean–atmosphere–wave–sediment transport (COAWST) modeling system, Ocean Modelling 43–44 (2012) 112–137.

Rogers, W. E., Babanin, A. V., and Wang, D. W. (2012). Observation-consistent input and whitecapping dissipation in a model for wind-generated surface waves: Description and simple calculations. Journal of Atmospheric and Oceanic Technology, 29(9), 1329-1346.

Response:

Comparisons for mean absolute error (MAE) and root mean square error (RMSE) of Hs and T02 are added in the revised manuscript *[Page 23, Lines 492-495; Page 25, Lines 509-511]*. Since the wave parameters and wave spectrum are carefully compared, we are afraid that presentation of wave fields at critical time snaps may not lead to much more additional information but a lengthy paper.