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**Title: Storm Gloria (2020): joint probability of multiple flood hazards and compound events in a paradigmatic Mediterranean event (New title: "Storm Gloria 2020: coexisting types of compound flooding in the West Mediterranean Region")**

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## Answers to Referee #2 comments

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(See in black your comments and in blue our answers)

**Comment 1:** I have only some minor remarks on the manuscript. Otherwise, the manuscript is written in good English and contains interesting and important results.

**Response 1:**

*The authors would like to thank you very much for taking the time to review this manuscript and the constructive comments made. The original comments are reproduced in black, followed by our responses in blue. Added or modified text to the manuscript is indicated in italic green.*

*Please find detailed responses next.*

**Comment 1:** I think the title of the manuscript is a bit misleading. The main topic of the manuscript is not the values of joint probabilities, which are discussed quite briefly, but the description of the Gloria storm and its impacts in different coastal regions. I suggest the authors to shorten the title to " Storm Gloria (2020): multiple flood hazards ..." (rest of the title as it is).

**Response 1:** *Thank you very much for your comment that has helped us to see a little mistake: it was a paradigmatic case of compound floods in the Mediterranean but not a paradigmatic Mediterranean flood case.*

*New title: "Storm Gloria 2020: coexisting types of compound flooding in the West Mediterranean Region"*

**Comment 2:** In many places, the authors refer to "wave height", "highest recorded wave height" , "maximum wave height" etc. I suppose they mean always the observed significant wave height, not measurements of individual waves. This should be clarified at least. I suggest to correct these terms when necessary, as in Table 2 and elsewhere.

**Response 2:** *We thank the reviewer for this helpful observation. We agree that the terminology needed to be clarified, as the values used in the manuscript refer to significant wave height rather than to individual wave measurements. We have therefore revised the manuscript and added the term "significant" where necessary, including in Table 2 and elsewhere. In addition, we have added the "CoExMed" subscript to distinguish these data from those obtained from the SIMAR dataset. Both concepts are now explained in the Methodology section:*

*"Wave conditions were characterized using two complementary datasets. The first consisted of hourly significant wave height (Hs) time series from the SIMAR wave reanalysis produced by Puertos del Estado (<http://www.puertos.es/es-es/oceanografia>), extracted at 50 nodes distributed along the Spanish Mediterranean coast. For the spatial analysis, each SIMAR node was associated with its nearest coastal municipalities. To estimate the probability of multivariate and spatially compound events, Hs time series from the CoExMed wave reanalysis (Toomey et al., 2022) were used at two offshore locations near Tordera (Barcelona) and Jávea (Alicante). Unlike SIMAR, CoExMed provides a long-term wave hindcast (1950-2021) generated using a consistent modelling framework (i.e. same wave model, computational grid, and atmospheric forcing throughout the entire period), making it more suitable for statistical analysis of extremes. However, it should be noted that CoExMed systematically underestimates storm wave heights relative to SIMAR"*

**Comment 3:** I suggest to add explanation of TCA (atypical cyclonic storms) to Table and Figure captions so that the reader does not have to search for it. Alternatively TCA could be mentioned already in the abstract.

**Response 3:** *Change done. The term TCA is only used by the Insurance Compensation Consortium when referring to the group of phenomena of meteorological origin different from floods (usually strong winds and tornadoes). We have added an explanation in the manuscript to clarify the concept, and we have made a revision of the use of this term throughout the manuscript according to your comments.*