Natural Hazards and Earth System Sciences Discussions

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1
https://doi.org/10.5194/nhess-2020-409-RC1, 2021

Comment on nhess-2020-409

Anonymous Referee #1

Referee comment on "Performance of the Adriatic early warning system during the multi-meteotsunami event of 11–19 May 2020: an assessment using energy banners" by Iva Tojčić et al., Nat. Hazards Earth Syst. Sci. Discuss., https://doi.org/10.5194/nhess-2020-409-RC1, 2021

"Performance of the Adriatic early warning system during the multi-meteotsunami event of 11-19 May 2020: an assessment using energy banners" is an interesting manuscript concerned with using numerical methods to forecast meteotsunami in coastal areas. The article contains a detailed description of the forecasting system performance during the multi-meteotsunami event that hit the eastern Adriatic coast in 2020. The objective of numerical experimentation is clearly stated. I must say, however, I had some difficulties in reading the manuscript and follow the author's approach. As it is now, I cannot evaluate the capacity of the modelling system in forecasting meteotsunami events.

An unclear point of this study is the definition of the disturbance trajectories (transects) and associated energy banners. Part of section 5 should be moved before (or at the beginning) of section 4 in order to understand the presented results. On this topic, the authors should clear explain:

- how the transects are selected;
- the number of transect per event;
- how to compare model results with observation at different locations (figures 3 to 5). As they are now, these figures are not useful for understanding the model performance;
- what's the temporal rate of change for identifying events (on which time interval);
- why the transect sampling criteria, which accounts for the open-ocean resonance, does not provide useful indications for selecting the transects.

Moreover, some aspects mainly related to the Meteotsunami Early Warning System need to be improved. The authors should provide more details about:

- the numerical models' implementation, e.g. model domains, grid resolution, boundary and forcing conditions;
- the observational systems, e.g. type of instruments, acquisition frequencies, filtering of the wind-wave effects on the tide gauge data;
- high-pass filtering procedure of observation and model results.

Minor comments:

- line 75: "(2) measurements from the MESSI (www.izor.hr/messi) observational network" does not provide useful information. I suggest replacing with: "(2) high-frequency air pressure and sea level measurements along …"
- line 84: … with the **2D unstructured** ADvanced CIRCulation (ADCIRC) model …
- line 87: … sea-level fields (including tides) **at the open sea boundary (Otranto Strait).**
- I strongly suggest splitting Figure 1 in two: the first containing only the map and putting all time series on a separate figure 2. Depth should be positive.
- Remove lines 98-101.
- line 110: The observational network **(called MESSI, www.izor.hr/messi),** …
- line 116: … at the tops of the bays that are normally most affected …
- Figure 3 should be moved below in the text.
- Page 10: I suggest to use the full name of the monitoring stations instead of their abbreviation.
- Lines 274-298: this part should be moved before (or at the beginning) of section 4.
- Figures 6 to 10: please include labels for the transect's beginning and end (e.g. A and B) in maps and spectrograms or specify that all transects are plotted from the west to the east. It is unclear what's the transect number.
- Lines 425-427 and 435-438: In both sentences, it's written that the ocean model fails in predicting meteotsunamis. As it is written it seems that the problem resides in the ocean model itself, while most of the uncertainty is associated with the atmospheric modelling of the meteotsunamigenic disturbance, as written in the subsequent phrases. I suggest reformulating the text in order to clarify that without accurate atmospheric predictions there are no chances to forecast meteotsunamis.