

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
<https://doi.org/10.5194/nhess-2021-325-RC2>, 2021
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Comment on nhess-2021-325

Anonymous Referee #2

Referee comment on "Reconstruction of wind and surge of the 1906 storm tide at the German North Sea coast" by Elke Magda Inge Meyer et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2021-325-RC2>, 2021

Review of:

Journal: NHESS

MS No.: nhess-2021-325

Title: Reconstruction of wind and surge of the 1906 storm tide at the German North Sea Coast

Author(s): Elke M. I. Meyer et al..

recommendation: minor revision

General comments:

The manuscript deals with the reconstruction of a storm surge event occurred in 1906 in the North Sea. The article is well written, pleasant to read, and scientifically sound. I have only some minor comments that the authors should clarify before this manuscript can be published.

Specific comments:

1,18: potential amplification... I would not call it potential amplification but constructive superposition or similar

Table 1: what do the two dots ":" mean in the tide gauge of Cuxhaven? If they mean "some other events" and then the 13th highest of 1906, the date 2013-12-06 has to be eliminated and substituted by ":".

Fig. 2: the entry “amplified water levels” is misleading. You may consider shifted storm surge or similar.

9,15: missing information grid 2 and grid 3

9,17: is this a bi-directional coupling, or only one-directional? If it is one-directional, what are the consequences of not allowing the higher and better simulated water levels leaving the fine grid and modifying the boundary conditions that are imposed? Please discuss.

Fig 7 and 8: wind speeds from reconstruction are normally lower than 20 m/s, but geostrophic wind speeds can go up to 40 m/s and even higher. Can you explain this feature?

16,1-3: please also see Ferrarin et al., 2021 and Cavaleri et al., 2019 and 2020 for adding different components of the water level and the importance of timing for storm surges occurred in Venice

Fig 13: it would be beneficial to also see only the storm surge component. If the plateau of the storm surge peak were quite flat, then a small shift of the timing would not have a big effect.

Here some references. The authors should feel free and not obliged to use these if they think they are appropriate.

Ferrarin, C., Bajo, M., Benetazzo, A., Cavaleri, L., Chiggiato, J., Davison, S., Davolio, S., Lionello, P., Orliani, M., and Umgiesser, G. (2021). Local and large-scale controls of the exceptional Venice floods of November 2019. *Progress in Oceanography*, 197, 102628. DOI:10.1016/j.pocean.2021.102628

Cavaleri, L., Bajo, M., Barbariol, F., Bastianini, M., Benetazzo, A., Bertotti, L., Chiggiato, J., Ferrarin, C., Trincardi, F., and Umgiesser, G. (2020). The 2019 Flooding of Venice and its implications for future predictions. *Oceanography*, 33(1), 42-49. DOI:10.5670/oceanog.2020.105

Cavaleri, L., Bajo, M., Barbariol, F., Bastianini, M., Benetazzo, A., Bertotti, L., Chiggiato, J., Davolio, S., Ferrarin, C., Magnusson, L., Papa, A., Pezzutto, P., Pomaro, A., and Umgiesser, G. (2019). The October 29, 2018 storm in Northern Italy — an exceptional event and its modeling. *Progress in Oceanography*, 178, 102178. DOI:10.1016/j.pocean.2019.102178

