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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Probabilistic characteristics of narrow-band long wave run-up onshore" *by* Sergey Gurbatov and Efim Pelinovsky

Anonymous Referee #1

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The NHESS paper 2019-176 "Probabilistic characteristics of narrow-band long wave run-up onshore" by Gurbatov and Pelinovsky presents an interesting analysis of random, long-wave runup with amplitudes and phases of offshore waves defined probabilistically. The paper is well organized and, except for some minor clarifications listed below, is well written. Important conclusions are given with regard to the validity of linear theory for runup and inundation probability distributions. Given the scope of the journal, it would be advisable to indicate how the results from this study impact current probabilistic long-wave hazard assessments, as indicated in Comment 1. Overall, the nature of the comments below, in my opinion, are minor. Upon revision, this paper should be an important contribution to NHESS.

Technical comments:

(1) For probabilistic tsunami hazard assessments (PTHAs) in particular, there have been several recent studies that approximate runup and inundation from a probabilistic determination of offshore wave characteristics as summarized by Grezio et al. (2017). For example, Lorito et al. (2015) use a Green's Law approximation to estimate inundation. Davies et al. (2017) use an "amp-factor" method derived from Løvholt et al. (2012). Similarly, Mueller et al. (2015) use "linear predictors" to estimate runup. Can the results of the authors' study be used to evaluate these various PTHA runup/inundation estimators? (2) L36: Løvholt et al. (2012) indicate that the hydrostatic assumption reduces runup variability, compared to including dispersion. (3) L46-56: Should also probably summarize the work of Carrier (1995) and Carrier et al. (2003). (4) L111-112: It is worth noting that Carrier (1995) also derives runup from along-shore (i.e., edge wave) propagation. (5) Eqns. 2.5-2.8: Carrier (1995) includes quadratic terms in these equations, deemed negligible. (6) It might not be advisable to include Section 6, since as the authors indicate, the complex interaction of breaking waves is not included.

Grammatical/typographical comments

(7) Citation formatting: when the authors are part of the sentence, do not place in parentheses (L46, 64, 171-173, 186). (8) L29-31: Important first sentence is awkwardly constructed. (9) L41: Space between "linearized" and "by". (10) L58-59: "Moreover, very often the leading wave turns out <not> to be the maximum one." (11) L62: "their help" is confusing. (12) L80 and elsewhere: Most likely "simple" wave equation will be misunderstood by most readers as an alternative name for the Riemann wave equation. (13) L99: "climbs"->"approaches" (14) L169: Which equation does "ODE" refer to? (15) L182: Remove hyphen before Br (could be interpreted as a negative sign) (16) L184: What does "last sea particle acceleration" mean? (17) L224-225: Awkward sentence. (18) L238: "what is another record" -> "which is another expression" (19) Fig. 2 caption: Indicate that this is for monochromatic waves? (20) L266-267: insert "W" after "vertical displacement" (correct?) How is W related to R, as a random variate? (21) L274:

Replace Russian character for “and” with English equivalent. (22) L308: “the equation mentioned last” -> “the last equation” (23) L351: Indicate that the Rayleigh distribution is for wave heights.

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