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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Wind-wave amplification mechanisms: possible models for steep wave events in finite depth" *by* P. Montalvo et al.

Anonymous Referee #1

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I have read with interest the manuscript by Montalvo et al. on the wind wave amplification. The authors extend the Miles mechanism of wind wave growth to finite water depth. I have never worked directly on the subject, but it seems to me a very straightforward extension of the Miles theory developed in infinite water depth. I'm quite surprised that it has not already been done after 56 years from the original work of Miles. The authors should make sure that their result is indeed original. The authors consider also the Jeffreys mechanisms in finite depth and discuss the conditions in which each of the mechanisms is dominant. Clearly, the Jeffreys effect has some relevance when waves are very steep and the sheltering effect is dominant, i.e. for young seas. The last part of the manuscript is devoted to some analytical solutions of the forced finite depth NLS equation. Using a known approach in the literature, the authors are able to map such

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equation into the standard NLS and analytical solutions are easily found. In general, the manuscript is well clear and well written; English is fluent. I have only minor comments: i) Should the boundary conditions, eqs. (3) and (4), be applied on z=0 and not on z=\eta? ii) Page 3104: Archimedian should probably be Archimedean. I understand what the authors mean, but I have never heard of “Archimedean interaction”. iii) While discussing the mapping of the forced NLS to the standard NLS, a Taylor expansion is performed. Should n(t) be 1/(1-2Dt) and not n(t)=(1-2Dt). The transformation is not identical to the one of Onorato and Proment, see eq (58) and eq (8) in Onorato and Proment. I wonder if there are some typos in one of the papers.

I suggest publication after minor changes.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 3099, 2013.