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Authors: Sung Bum Yoon, Jong-In Lee, Young-Take Kim and Choong Hun Shin
Title: Laboratory and numerical experiments on stem waves due to monochromatic waves along a vertical wall
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Summary of responses:
We appreciate the interest and criticisms of the referee on our manuscript entitled “Laboratory and numerical experiments on stem waves due to monochromatic waves along a vertical wall”. We hope that the revision we made could have well reflected the referee's comments.

< Major points >

Comments and Suggestions	**Response**	**Page Reference (Original)**	**Page Referred**
In the results which illustrate the comparison between experiments, numerical simulations and analytical solutions, stem waves should be better highlighted. In particular, looking at the plane behavior of the waves depicted by Figs. 2 and 3, it would be interesting to present 3-dimensional results in addition to the existing 2-dimensional plots (Figs. 4 to 21). Since experimental measures were only collected along the x axis and at two specific y alignments, they do not cover the whole domain. However, numerical results from the REF/DIF model may be used to illustrate what happens in the whole domain for cases which clearly show existence of stem waves, e.g. using color maps to represent normalized wave heights H/H0 in the x/L-y/L domain. Such 3d results may also be used to explain the wave reflection induced by the stem boundary. To this aim, the sentence at P11 L24-25 must be expanded.	We corrected as referee suggested. “Fig. 22(a) and 22(b) show the comparison of the three-dimensional plots of normalized wave height for MLS1 and MLL1 cases, respectively, based on the numerical results of REF/DIF. For the nonlinear case, the overall amplitudes are much smaller and the stem waves are developed along the wall as shown in Fig. 22(b). The stem wave height is nearly constant and the width of the stem waves tended to increase along the wall. Fig. 23(a) and Fig. 23(b) present the comparison of the three-dimensional plots of normalized free surface displacements for MLS1 and MLL1 cases, respectively. From Fig. 23(b) it can be seen that the stem waves propagate along the wall. Fig. 24 shows the contour plots of the instantaneous free surface for MLS1 and MLL1 cases. The incident waves are reflected from the wall for the linear case. However, they are both refracted and partially reflected at the edge of stem region or the stem boundary as depicted also in Fig. 2.”		P9 L28-P10 L2

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With the purpose to properly identify stem waves in Figs. 4 to 21, these should be better highlighted, e.g. adding a further/overlapping colored line between the wall and the first nodal line. Such improvement will clarify the stem wave description (e.g., P8 L26-31).	We corrected as referee suggested. "The red lines shown in the figure represent the stem waves. The definition of stem width is rather controversial. Yue and Mei (1980) defined the stem width as the distance from the wall to the edge of the uniform wave amplitude region in the direction of incident wave crest lines. However, it is not an easy task to locate the edge of the flat region. On the other hand, Berger and Kohlhase (1976) defined the stem width as the distance along the stem crest lines from the wall to the first nodal line of standing wave pattern which is easier to identify from the measured data. In this study the stem edge was determined as a point which is apart from the first nodal point towards the wall by a distance λ between the first node and the second antinode (see Figs. 8 and 9). This new definition of stem width is easier to determine and is consistent with the definition of Yue and Mei (1980)."		P8 L5-13
Photo 2 suggests a "beehive" wave pattern. This is typical of the cross-sea, generated by two or more waves which interact as a consequence of, e.g., reflection, refraction. The authors are required to comment on that point referring to studies on propagation of plane waves (e.g., Le Mehauté, 1976; Mei, 1983) and cross-sea (Postacchini et al., 2014).	We corrected as referee suggested. "Photo 2 shows the hexagonal or beehive wave pattern captured during the experiment in front of a vertical wall for the case of $\theta_0 = 30°$. This is typical of the cross-sea generated by the oblique interaction of two or more traveling plane waves (see e.g., Le Mehauté, 1976; Mei, 1983; Nicholls, 2001). Postacchini et al. (2014) studied the generation and evolution of large-scale eddies of vertical axis generated by the breaking of two crossing wave trains."	P6 L15	P6 L22-25
In the experiment description, the displacement of the measuring points should be clarified. In particular, two incident wave measuring points are illustrated in Fig.3, while three measuring points are recalled at P6 L18-19. Clarifications are needed about all used measuring/checking points (notice that five points are represented in Fig.3).	We corrected as referee suggested. "Table 2 gives a summary of the wave height measurement positions."		P6 L20-21 and Fig. 3.

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< Specific points >

Comments and Suggestions	**Response**	**Page Reference (Origin)**	**Page Referred**
the last sentence of the abstract is awkward/unclear and should be rephrased.	We corrected as referee suggested. "The results of present experiments support favorably the existence and the properties of stem waves found by other researchers using numerical simulations."	P1 L20-21	P1 L20-21
it should be ". . . the effects of both nonlinearity and angle of incidence. In the final section. . .".	We corrected as referee suggested. "the effects of both nonlinearity and angle of incidence. In the final section,"	P2 L31-32	P3 L4-5
when talking of "recent version of REF/DIF", a significantly recent reference should be included (not only those of 1986 and 1994); otherwise, "latest version" is more appropriate.	We corrected as referee suggested. "the latest version of REF/DIF, a wide-angle nonlinear parabolic approximation equation model developed by Kirby et al (2002),"	P3 L8-9	P3 L13-14
"each with dimensions of 0.5m . . . in height and driven by".	We corrected as referee suggested.	P5 L13-14	P5 L19-20
"numeric number" should be replaced with "number" or "numeric digit".	We corrected as referee suggested..	P5 L27 and P6 L2	P6 L6 and P6 L8
" 'shorter' or 'longer' waves in terms of period, respectively. . . or 'large' waves in terms of incident wave height, respectively".	We corrected as referee suggested.	P6 L1-2	P6 L6-8
"of the incident wave is three times larger than the MSS-series waves".	We corrected as referee suggested.	P7 L21	P7 L30
remove "downwave".	We corrected as referee suggested.	P7 L27	P8 L2
"in good agreement"; check use of "agreement" throughout the text.	We corrected as referee suggested.	P7 L31	P8 L14 P8 L33 P9 L12 P10 L3 P12 L20 P13 L8
"the measured data, probably because of nonlinear interactions between incident".	We corrected as referee suggested.	P7 L32-33	P8 L15-16
"to reach a constant value".	We corrected as referee suggested.	P8 L7	P8 L22
"The amplitude of the MLS incident waves is chosen to provide the same steepness, … , as the MSS waves. Hence, the wave patterns observed in the MSS-series (Fig.4) are similar to the results of the MLS-series".	We corrected as referee suggested.	P8 L19-21	P9 L1-3

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if β is the slope ratio, β_ϵ should be the slope of the stem boundary; if so, this must be clarified in the text.	We corrected as referee suggested. "where $\beta\epsilon$ is the slope of the stem boundary as shown in Fig.26(a)."	P10 L24-26 P11 L1-4	P11 L22
the wall angle is θ_0, please amend	We corrected as referee suggested.	P11 L1 and L4	P11 L18 and L21
the term " l " must be added to Fig.23b.	We corrected as referee suggested.	P11 L22 and Fig.23b	Fig.23b.
"The key results derived from this study are here illustrated".	We corrected as referee suggested.	P12 L12	P12 L27
"agree".	We corrected as referee suggested.	P12 L17	P13 L5
the y-axis label should be "H/H0".	We corrected as referee suggested.	Fig.4 to 21	Fig. 4 to Fig. 21