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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Study on the influence of seafloor soft soil layer on seismic ground motion" *by* Jingyan Lan et al.

Jingyan Lan et al.

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Dear Referee 2. We appreciate your very useful and professional comments on the manuscript. I will revise or explain the following six comments one by one. 1. We left out the unit of figure 1 in the original manuscript, replot figure 1, and gave the unit "m" in the new manuscript. The new figure is as follows: 2. In this paper, it is assumed that water is an incompressible ideal fluid, so the compression coefficient of water is not needed in the calculation. The four calculation models in this paper are all saturated soil, so the Poisson's ratio of soil is 0.5, which has been supplemented in Table 1. 3. We double-checked the units of G and K, and it is true that their units are MPa, not kPa. 4. Yes, I'm sorry that we made a mistake about the title of Table 3, which has been revised now. 5. We agree with the reviewers and supplement the results of the

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Discussion paper

response spectral ratio between the surface and base acceleration, and the necessary analysis and discussion are given in this paper. The supplementary discussion is as follows: In order to investigate the amplification effect of the surface acceleration response spectrum in each period, the result of the acceleration response spectrum is divided by the base input response spectrum, and the result of the response spectral ratio is obtained, as shown in figures 5 and 6, in which the input form of ground motion in figure 5 is SV wave, and the input form of base ground motion in figure 6 is P wave. According to figure 3 and figure 5, it can be found that the maximum value of reaction spectrum ratio appears at the periodic point of the maximum value of response spectrum for the SV wave as input, and the amplification effect is very obvious, and the maximum amplification factor is about 8 to 10. As the result of the input form of P wave, we find that the period of the maximum acceleration response spectrum of figure 4 is inconsistent with that of the maximum response spectrum ratio of figure 6, and the result of the response spectrum ratio shows an undulating shape. Generally speaking, the surface response spectrum is not magnified compared with the base response spectrum, and shows a shrinking result in each period. 6. That is right, the Mohr-Coulomb constitutive model used in the manuscript is an ideal elastic-plastic model. That is why we choose the M-C model for constitutive model of soil layers. And another important reason is that the parameters of M-C model are relatively few and can be easily obtained in the laboratory tests, so it is widely used in the practical work of soil seismic response analysis. Thank you for providing us with comments and suggestions on our manuscript.

Please also note the supplement to this comment:
https://nhess.copernicus.org/preprints/nhess-2020-177/nhess-2020-177-AC2-supplement.pdf

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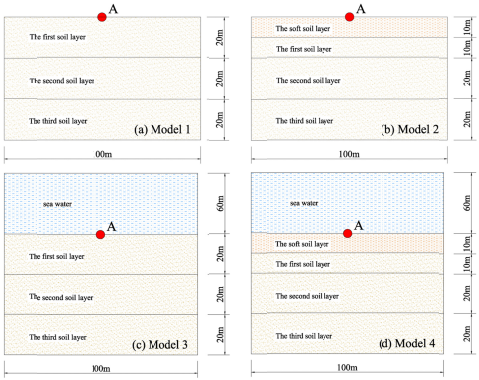

Figure 1. Four typical free field models

Fig. 1.

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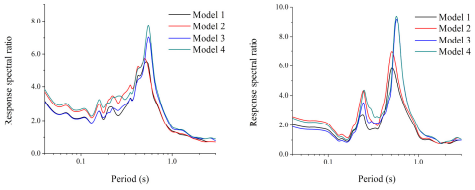

Figure 5. Response spectral ratio between the surface and the base input of SV wave form

Fig. 2.

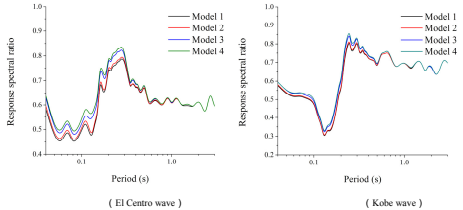

Figure 6. Response spectral ratio between the surface and the base input of P wave form

Fig. 3.