

Nonlin. Processes Geophys. Discuss., referee comment RC1
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Comment on npg-2021-31

Anonymous Referee #1

Referee comment on "Regional study of mode-2 internal solitary waves at the Pacific coast of Central America using marine seismic survey data" by Wenhao Fan et al., Nonlin. Processes Geophys. Discuss., <https://doi.org/10.5194/npg-2021-31-RC1>, 2021

The study reports on characteristics of mode-2 internal waves in the Pacific coast of Central America using marine seismic survey data. Observations of mode-2 internal waves in the ocean are relatively few. The research may contribute to our understanding of this wave phenomenon. I have some major concerns.

1. Line 27: Satellite remote sensing can not see the ocean interior. Thus, there is not an issue of vertical resolution.
2. Line 35: Most of the cited references in the paragraph use very ideal stratification. I am not sure how much these researches are relevant to mode-2 internal waves in the ocean.
3. Line 103: The mode-2 ISWs in the actual ocean has continuous structure?
4. Line 106: I am sorry I do not understand why the equivalent three-layer model is used to define the amplitude of mode-2 ISWs. In oceanography, the amplitude is defined as the maximum vertical displacement of isopycnals (e.g. Shroyer,2010,JGR).
5. Line 135: I am not familiar with the seismic reflection method, and I can not ensure the correctness of Eq.(1) and Eq.(2). However, my intuitive idea is that the actual wave form need to be obtained first.
6. Line 172: Is the dimensionless amplitude $2a/h^2$ equivalent to the one used by Brandt et al. 2014? The equivalent three layer model differs from Fig. 1 in Brandt et al. (2014).

7. Line 322: In Figure 8, the nondimensional wavelength does not seem to decrease with increasing nondimensional amplitude when $2a/h^2 < 1$. My observation is that the nondimensional wavelength may change from 2.5 to 7 for a fixed nondimensional amplitude.

8. Line 400: How is the wave frequency defined? It is very important because the eigenfunction crucially depends on the wave frequency. Moreover, I note that Holloway et al.(1999) do not use wave frequency in the eigenvalue problem.

9. Please consider to reduce the use of long sentences in the manuscript.