

## ***Interactive comment on “Kinematic parameters of internal waves of the second mode in the South China Sea” by Oxana Kurkina et al.***

### **Anonymous Referee #1**

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#### General comments:

Internal waves in the South China Sea (SCS) are among the largest that have been observed in the world's oceans and have been under intensive studies in the last two decades. The focus has been mostly on the first mode internal tides and internal solitary waves, whereas internal waves of the second mode have also been occasionally reported, and it seems that the latter are not unusual to be observed in the SCS. This paper summarises the spatial distributions of some kinematic parameters of second-mode internal waves in the SCS. The classic Gardner equation was employed in the study. Similar maps for the first mode internal waves have been constructed before, therefore, the current work can fill in the gap for the similar maps of the second mode internal waves. The maps can serve as a useful reference for quick assessment of

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wave properties of the second mode. The work also fits the scientific scope of the journal. I would recommend publication of the work subject to some (minor) revision in order to meet the level of publication. I have my comments listed below.

#### Specific comments:

1) The authors examined the summer July conditions in the SCS, and I wonder if the authors have also looked into winter conditions? If the authors have done so, it would be nice if they could include a short paragraph illustrating the main differences or similarities. No worries if there is too much work. 2) P.1 L.24: Internal waves in the SCS are not excited by interactions of barotropic tides with the Kuroshio. Rather, they are generated by tide-topography interaction in the Luzon Strait, and Kuroshio can serve as a background current and modify the generating conditions. 3) P.1 L.10: is 'release of storm surges' a type of 'strong atmospheric disturbances'? 4) P.3 L.34: while I admit that it is meaningful to construct such 2D spatial kinematic maps of internal waves in the SCS as the authors have done, I don't think it can be as 'urgently needed'. 5) P.4 L22 and elsewhere: Brunt–Väisälä frequency. 6) P.9 L6-12: I don't think it correct and necessary to have such a discussion here about the radiation from the sun; suggest remove it. 7) P.12 L.25: 'Data availability' is not about the data that you used during your research, but it is about your own output data in the work; see the introduction here: [http://www.nonlinear-processes-in-geophysics.net/about/data\\_policy.html](http://www.nonlinear-processes-in-geophysics.net/about/data_policy.html) 8) Figs. 6-8: please consider using the same colorbar scale in these three figures such that the readers can have a more direct comparison of the three different depths. This also applies to Figs. 11 & 13. 9) Figs. 14&16: please consider using a white-centered colorbar for a better visualisation of positive and negative values.

#### Technical corrections:

1) P.2 L.3: text correction. 2) P.2 L.5-6: sloppy; please reword. 3) P.3 L10: Carnes, 2009 4) P.6 L.20: quadratic term of Eq. (1)? 5) P.7 L.19: Kurkina et al. (2017) 6) P.8 L. 7: text correction. 7) P.8 L. 12: text correction. 8) P.9 L.24&25: Fig. 13C 9) P.11

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L.24: ... solitions are strongly... 10) P.12 L.16: ...are qualitatively similar... 11) Fig. 12  
caption: with a power function (8)

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