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Comment

# ***Interactive comment on “Assimilation of decomposed in-situ directional wave spectra into a numerical wave model on typhoon wave” by Y. M. Fan et al.***

**Anonymous Referee #2**

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This paper timely provides a useful assimilation approach by decomposing the directional wave spectra, which considerably improves the wave predictions. The approach is particularly important in forecasting the typhoon-induced waves, which vary rapidly in space and time.

The paper is well structured and clearly demonstrated the improvement of wave predictions for two typhoon events occurred in 2006. However, I suggest the following comments to be further discussed:

1) Expend further the descriptions of two assimilation methods, so that two methods

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can be compared.

- 2) Elaborate further the Optimal Interpolation (OI) scheme, as well as OI-P.
- 3) If possible, present and discuss in detail the difference of wave spectra obtained from SAR and pitch-and-roll buoys.
- 4) Clarify the definition of "the main wave systems".
- 5) Justify further the use of Eq (7) instead of Eq (5), and define the parameter  $d(\delta)mk$  for  $Om_k$ .
- 6) The conclusion on the "optimal" numbers of direction and frequency for decomposition is weakly supported as those are the up-limits of the tests carried out.
- 7) In Fig. 3 labelling is unclear.

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 3967, 2013.

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