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Interactive comment on "Tidal elevation, current and energy flux in the area between the South China Sea and Java Sea" *by* Z. X. Wei et al.

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We thank Referee 2 for the useful comments on the manuscript and our responses to the issues mentioned are given below.

1. This is a well prepared paper. The main message of the paper on the tidal dynamics in the area between the South China Sea and the Java Sea is clear. Since this region is commonly chosen as the open boundary in the numerical model of the SCS, the results shown in the paper are important and ready for immediate application. Below are two specific comments for the paper.

Reply: Thanks for your positive evaluation.

2. In the results section, the authors may need describe their harmonic analysis

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method in details. Since it is a trivial work to extract the harmonic constants of the eight tidal constituents M2, S2, N2, K2, K1, P1, O1, Q1 in Foreman or Pawlowicz's program, it is not clear why the harmonic constants of P1 and K2 in the current method has to be inferred indirectly.

Reply: In the text we have added "According to Rayleigh criterion, to separate P1 from K1 and K2 from S2 reqires 182.6 days (e. g., Pugh, 1987, p.113)". In the references we added "Pugh, D.T., 1987. Tides, Surges, and Mean Sea Level. John Wiley & Sons Ltd, 472 pp".

3. In the discussion section, the comparisons between the observational and the four global tidal model results are very ingesting. It shows that not a single model could produce an optimal solution for tidal prediction in this area. However it is not very clear what causes the inconsistent behaviors among the tidal models and how this could guide one to determine the tidal boundary conditions in a model. Since such a topic may attract a wide audience, this is the aspect which should be emphasized and is expected to improve the paper significantly.

Reply: These four global ocean tide models were developed on the basis of satellite altimeter data, mostly TOPEX/Poseidon and Jason1/2 data. However the ground tracks of TOPEX/Poseidon and Jason-1/2 are coarse and altimeter measurement are relatively not accurate in shallow waters, these are likely the sources of the difference between models and observations. The following table (it has been attached to Table A1, for details see supplement) lists the average deviations of five stations between four tidal models and observations. It shows that DTU10 is the best one in the area between the South China Sea and Java Sea, due to use of more satellites and longer altimeter measurements. Moreover, DTU10 has the highest resolution (0.125 by 0.125 degree) among these four tide models. If the open boundary of a tidal model is located in the area between the South China Sea and Java Sea, DTU10 is the best choice for deriving open boundary condition.

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Please also note the supplement to this comment:
http://www.ocean-sci-discuss.net/12/C1675/2016/osd-12-C1675-2016-
supplement.pdf

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Interactive comment on Ocean Sci. Discuss., 12, 2831, 2015.