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Interactive comment on "Sensitivity study on the main tidal constituents of the Gulf of Tonkin by using the frequency-domain tidal solver in T-UGOm" *by* Violaine Piton et al.

Anonymous Referee #2

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General comments:

The authors applied the frequency-domain tidal solver in the hydrodynamic unstructured grid model T-UGOm to examine the sensitivity of the main tidal constituents of the Gulf of Tonkin. The model results are compared with observation s collected from satellite. The model validation suggests that the model is able to capture the tidal dynamics in the Gulf of Tonkin. The authors also constructed a series of sensitivity model experiments to test the bathymetry and bottom friction parameterization. In my opinion, the paper is potentially a valuable contribution to the scientific literature of the Gulf of Tonkin, as the model constructed by the authors is able to well capture the tidal

dynamics in the Gulf of Tonkin. More over the paper is clear and well written. In general, the figures are neat. I recommend publication of the paper in Geoscientific Model Development Discussions after minor revisions, in response to the following concerns:

Specific comments:

1) L359-360: For the tidal open boundary condition, nine tidal constituents were considered. Why do you include the shallow water constituent M4? Does this tidal constituent contribute significantly to the tide in the GOT? How about other shallow water constituents such as MS4 and M6?

2) The model simulated tidal constants are compared with satellite data. Have the authors tried to compare the model results with the observations from tide gauge stations along the coast of the Gulf of Tonkin? How about the tidal current in the simulations? Have the authors validated the model-simulated tidal current with observations?

3) The Red River is the most important freshwater discharge in the Gulf of Tonkin. The freshwater from the Red River may influence the tide near the estuary. Have the authors considered the effect of the freshwater discharge on the tidal simuations?

Technical corrections:

L106: "Quiongzhou Strait" should be Qiongzhou Strait.