

## ***Interactive comment on “Synoptic fluctuation of the Taiwan Warm Current in winter on the East China Sea shelf” by Jiliang Xuan et al.***

### **Anonymous Referee #2**

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Comments on ‘Synoptic fluctuation of the Taiwan Warm Current in winter on the East China Shelf’ by Xuan et al

In this manuscript the authors investigated short term variations (periods of 3-15 days) of the Taiwan Warm Current in the winter 2009 on the East China Shelf, using the results of multi-year model simulations of FVCOM. They identified two areas of strong fluctuations, namely, the north of Taiwan and the further northern area of the inshore region, and found that the main driving forces for the fluctuations were the Taiwan Strait Current and the winter monsoon winds. I find the paper is interesting and well written, merits to be published in the Ocean Science after some minor clarifications and corrections outlined below.

The title ‘. . . . in winter on the East China Sea Shelf’. In fact only results from the winter

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(Feb) 2009 were analyzed and presented in the paper and no attempt was made to extend to other winters. I, therefore, suggest that the title to be changed to ‘...in the winter of 2009...’, or similar.

Line 133-135, on the model, ‘the river discharge of the Changjiang and Huanghe ...’. In the immediate region of the study, there are other important rivers, e.g., Qiantang, etc.; did the authors include them; if not, why not.

Validation of the model. The model results were validated in the coastal regional of the East China Sea shelf and good agreements between measurements and model were obtained. However this is limited to the shallow coastal region. It is well known that the FVCOM uses a sigma co-ordinate and prone to errors in the region of steep topography. Therefore authors should at least caution readers that in the slope region, such as the Kuroshio intrusion (line 465-470), model results are less reliable unless a good validation is provided.

Line 264. ‘... in wintertime, both branches flowed on the isobaths, which is fully in accordance with the conservation of potential vorticity’. It implies ‘cross isobaths flow is not following the pv conservation law’, which is not correct. btw, ‘on the isobaths’ > ‘along the isobaths’.

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