

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

**Jiliang Xuan et al.**

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Dear Referee,

Thank you very much for your comments on our joint manuscript. According to these comments, we have made corrections which hopefully could clarify the points brought up by you. We responded to these comments one by one in the attachment. The revised manuscript is also attached in the supplement.

Best regards,

Jiliang Xuan, Daji Huang, Thomas Pohlmann, Jian Su, Bernhard Mayer, Ruibin Ding,  
Feng Zhou September 29, 2016

Response to referee

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Comments: The minor comments are, 1. There are too many keywords, I suggest that “Taiwan Warm Current, Taiwan Strait Current, Kuroshio, Zhe-Min Coastal Current, East China Sea” are enough.

Author’s response: We agree that seven keywords are too many. Therefore, we keep the first five keywords which are more important and more frequently used in the manuscript than the last two keywords.

Author’s changes in manuscript: Line 41-43: The last two keywords “Zhe-Min Coastal Current, wind” were deleted.

Comments: 2. The model domain and open boundaries are not clear, they may be drawn or indicated in figure 1 or 2.

Author’s response: We now have drawn the model domain and the open boundaries in Fig. 2 (Left panel).

Author’s changes in manuscript: Line 801-809: We added a left panel in Fig.2 to show model domain, open boundaries and grids. The Fig. 2 will be attached in this reply.

Comments: 3. In figures 1011, can you calculate the confidence level of the correlation?

Author’s response: We used the MATLAB function “corr” to compute the declining indicator, i.e., the p value which can directly be related to the confidence level. E.g., if the confidence level is larger than 95

Author’s changes in manuscript: Line 856-857: We changed the statement “whereby R has statistical significance when the p value is less than 0.05.” to “whereby R has statistical significance and the confidence level is larger than 95

Comments: 4. A new paper by Liu et al. (2016, Numerical simulation of the Kuroshio intrusion into the South China Sea by a passive tracer. Acta Oceanologica Sinica, 2016, 35(9), 1-12. ) used tracer simulation to study the Kuroshio intrusion, their model

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domain covered some of yours. I suggest in discussion of your Fig.14b, comparison between both model results is beneficial.

Author's response: Thanks for the information of the new paper by Liu et al. (2016). We have carefully compared the MITgcm results from Liu et al. (2016) and the FVCOM results from this manuscript. Their results nice complement our study, since they provide the information on the origin of the TSC, which is missing in our paper. Liu et al. (2016) showed that the winter TSC originated in a small branch of Kuroshio intrusion from the Luzon Strait. Their Fig. 14 shows that the winter TSC will flow into both the ECS shelf and the Kuroshio region showing significant synoptic fluctuations.

Author's changes in manuscript: Line 455-458: We referred to "Liu et al. (2016)" in the text and discussed about the route of TSC from the two models. A discussion was added after "... the TSC also had an effect on the distribution of Kuroshio water north of Taiwan.": "Liu et al. (2016) showed that the winter TSC originated from a small branch of Kuroshio intrusion into the Luzon Strait. Our results complement this picture, since they show that most TSC particles flow into the TWC offshore branch under the influence of cross-shore fluctuation."

Please also note the supplement to this comment:

<http://www.ocean-sci-discuss.net/os-2016-70/os-2016-70-AC1-supplement.pdf>

Interactive comment on Ocean Sci. Discuss., doi:10.5194/os-2016-70, 2016.

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