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***Interactive comment on*** “Impact of physical processes on the phytoplankton blooms in the South China Sea: an eddy-resolving physical-biological model study” **by Y. Sasai et al.**

**Anonymous Referee #1**

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The manuscript ‘Impact of physical processes on the phytoplankton blooms in the South China Sea: an eddy-resolving physical-biological model study’ by Sasai et al. mainly examines the mechanisms that control distributions of chlorophyll concentration in two monsoon-driven upwelling regions, Vietnam coast and west of Luzon in the South China Sea. Although it appears a sound analysis, I do not find it sufficient for publication in Biogeosciences. The results presented in this paper, such as monsoon induced coastal upwelling associated eddy advection and upwelling, Kuroshio intrusion, Mekong river plumes, etc. have been either discussed or published in old

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publications. To those people who have been working on the SCS biogeochemistry for many years, the understanding to the generation mechanisms of the phytoplankton blooms in those two regions is pretty clear now. I really appreciate the work of this paper in terms of methods, analysis, and conclusions, but it is just that I do not see anything new from it for publication in BG, as BG holds such a high standard for selecting papers. I do suggest maybe submit to another journal.

The major concern I have about this paper is the validation of the model results. This is a three-dimensional coupled model. However, the validation of the model results is only limited to comparisons of modeled surface chlorophyll with SeaWiFS data. Before going to further analysis, I think vertical chlorophyll profiles, nutrient conditions, mixed layer depth, nutricline depth, SSH, eddy activities, even surface circulations etc. are all key factors that could affect the outcome of this work and need to be validated thoroughly and carefully.

In the paper, why do you choose 73 m depth layer to analyze data, and also in figures 7, and 9, you use 78 m depth to look at vertical velocity? Any particular reason? As in summer condition and for biology, the bottom of euphotic zone is usually deeper than 75 m, while it becomes shallower during winter in the SCS.

In figures 3 and 4, where comparison between model and SeaWiFS is performed, statistical quantities (bias, correlation, RMS, etc.) are needed. Explanations about the bad performance in Box-V are also needed.

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