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Ocean Science
Discussions

Interactive comment on "Eddy characteristics in the Northern South China Sea as inferred from Lagrangian drifter data" *by* J. X. Li et al.

Anonymous Referee #1

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The authors develop a new eddy detection algorithm based on the geometry of satellite-tracked drifter trajectories, and conduct it in the northern South China Sea (hereafter NSCS) to discuss the eddy characteristics in the NSCS. The results are verified using the results of SSHA, and this also verifies the usefulness and credibility of the eddy detection method. Perhaps, the most interesting and larruping results of this paper is about the spatial and temporal distribution of three types of eddies in the NSCS according to the eddy radii, especially the submesoscale eddies unresolved by satellite remote sensing data (e. g., SSHA, MWSST).

I do not have major criticisms of the work. The title and abstract are appropriate for this work, and the figures look clear. The methodology is sound, and the data analysis appears to be correct. Although there are several grammatical errors throughout the

paper, nothing is too serious for nonnative speakers. Before it is recommended the acceptance for publication on the OS, I would suggest that the following minor comments and questions:

1. In section 1 introduction: second paragraph. The authors mentioned that "The eddy characteristics in the NSCS have not been well documented", but to my knowledge, it is not really the fact. I recommend the authors notice these two literature (Nan et al., 2011; Wang et al.; 2008) concerning the eddies characteristics in the NSCS. The authors may wish to improve the section 1 after the thorough reading. In this way, this will make the interested readers understand the correlative information before studying the authors' distinct view on the eddy characteristics in the NSCS.

2. In section 3.4. I have a major concern with respect to the eddy generation mechanisms in the SCS. There are many causes for the generation of eddies in the SCS, such as wind stress curl, topography, instability of the Rossby waves, Ekman pumping, the interaction of monsoon circulation with land, the interaction between the - effect and topography, orographic wind jets, and instability of the background currents, and among others (Nan et al., 2011). I recommend the authors should explain it in detail, and it would be helpful to state this point to the readers.

3. In section 3.5. I do not agree with the authors' analysis of the geostrophic or ageostrophic balance of these eddies in the NSCS. Why are the submesoscale eddies ageostrophic from eddy edges to eddy cores? The authors are suggested to give more compellent explanation.

4. Two typos errors: in the first sentence of Abstract (Page 1576, Line 1), "on the Northern South China Sea" should be "in the Northern South China Sea". Figure 5, the label of x-axis should be "Longitude" not "Longtitude".

5. Just a minor comment, Figure 3, Figure 4 and Figure 5 all depict the drifter trajectories. However, the labels of their axes seem not uniform, in Figure 3 and 4 it is "134 135 136. . ." , while in Figure 5 it is "50W 49W 48W. . .". It would benefit the manuscript

if the three figures maintained the same formatting.

References:

Nan, F., Z. He, H. Zhou, and D. Wang (2011), Three long-lived anticyclonic eddies in the northern South China Sea, J. Geophys. Res., 116, C05002.

Wang, D., H. Xu, J. Lin, and J. Hu (2008), Anticyclonic Eddies in the Northeastern South China Sea during Winter 2003/2004, J. Oceanography, 64, 925-935.

Interactive comment on Ocean Sci. Discuss., 8, 1575, 2011.