

Comment on essd-2022-77

Anonymous Referee #2

Referee comment on "SEIA: a scale-selective eddy identification algorithm for the global ocean" by Yikai Yang et al., Earth Syst. Sci. Data Discuss.,
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Nowadays, researches towards eddy are highly connected to the automatic eddy identification algorithms. The paper presents a new one based on the SLA dataset and rule of scale-selective, which is well-organized and in a good theme. The authors highlight two improvements featuring in the detection and tracking processes when compared to the previous methods. The apply of the new algorithm verify its validity.

Still, there were some questions which came to my mind while reading the paper and hence I suggest the authors to put some more effort and improve this work. There are several things need to be clarified before publishing, particularly about the preset parameters of the new algorithm. Therefore, I recommend this manuscript to be minor revision.

- In the section 2.2, the authors mentioned that "*we consider only the simple contour condition with only one core (Fig. 1b): the concentric (Fig. 1c) and intersecting (Fig. 1d) closed types degrade to this type.*" How is this "degrade" achieved? More explanation is needed.
- Among the process of "(i) Searching for SLA peaks", a moving 3 3 grid window is addressed to search peaks of SLA. In Fig. 2a, there are so many peaks occurring nearshore. Is it rational, and how did the authors remove them? Also in this process, the authors mentioned that "*SLA shallower than certain depth (50 m for SEIA) will be masked*" because of the AVISO nearshore issue. Why did the depth set as 50 m. Any references?
- In the determination of the parameter Dt , the intersecting ratio, the authors illustrated that 0.39 is too ideal for a real scenario and set to 0.25. The value of 0.25 is based on what kind of consideration? There is no good explanation.
- "*...when an eddy has a state of "-tracked-missing-" in two continuous time steps, all the missing information is temporally replaced with the former tracked information and seen as a complement state, allowing the tracking procedure to continue.*" Is it reasonable to base eddy tracking on this complement eddy?