

Earth Syst. Sci. Data Discuss., referee comment RC1
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Comment on **essd-2022-77**

Anonymous Referee #1

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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The manuscript is lack of innovations and highlights. It attempts to make improvements for eddy identifying and tracking, including the scale-selective scheme in eddy detection and the overlap scheme in eddy tracking. But there are still some major parts need to be improved in the paper. The suggestions are as follows:

- The scale-selective scheme corresponds to the radius of eddies ranging from 25 to 125 km in the paper, which is incomprehensible. The formula as Line 161 shows present the scale-selective scheme, which means that you still select eddy contour by the threshold (P_{min} - P_{max}). However, the scale of eddy is changed with latitude, which should be considered in this paper.
- The validation part is not sufficient. Other source of data should be considered in the validation, like remote sensing data (sst, sss or oceanic chlorophyll) and in situ data (drifter or argo).
- In this paper, the data set of eddy during 2015-2019 are detected and tracked. The SLA data set from 1993 is available, which should be adopted to analysis. Meanwhile, the systematic comparison between eddy dataset in this paper and existing eddy datasets (like [1,2]) should be conducted in this work.

The manuscript is written very carelessly with many errors and unclear places. The level of English (grammar, style and syntax) throughout the manuscript does not meet the journal's required standard. I suggest rejecting the manuscript.

[1] Faghmous, J. H. et al. A daily global mesoscale ocean eddy dataset from satellite altimetry. *Sci. Data* 2:150028 doi: 10.1038/sdata.2015.28 (2015).

[2] Chelton, D., Schlax, M. & Samelson, R. Global observations of nonlinear mesoscale eddies. *Prog. Oceanogr.* 334, 328–332 (2011).

