Ocean Science

Discussions

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Interactive comment on "GEM: A Dynamic Tracking Model for Mesoscale Eddies in the Ocean" *by* Qiu-Yang Li et al.

Anonymous Referee #3

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General Comments: I'm interesting in this paper. Compared with existing eddy tracking algorithms, the genealogical evolution model is advanced. This model is helpful to track dynamic evolution of mesoscale eddies in the ocean (especially eddy merging/splitting events), and efficiently present the eddy genealogical tree. So, I recommend this paper can be published. But I still have some questions below.

Major comments: 1. The mainly parameters are overlap rates r1 and r2, so the results will be sensitive to the temporal resolution of data (time step) and the movement speed of eddies. 1) If the time step is lager (e.g. you use AVISO weekly data), the critical value rc should be set smaller. 2) There are some different dynamic environments in NPO (e.g. background velocity in KE , STCC . . ...), the movement speed of eddies are also different. Is the constant rc properly in your model? I think the authors should discuss how to properly set the critical value rc , and pay attention to the limit conditions.

2. The Look-ahead approach is better and advanced. But N and rc should not be completely independent. In 5.2, "Although N=4 and N=6 might be better", is the constant rc reasonable on day 0 and day N+1 ?

Specific Comments: 3. L14 in the abstract, I was confused about 'a two-dimensional (2-D) vector' in the beginning. I thought the authors used the velocity field. Phrase similar to 'a pair of overlap rates' is simple.

4. L22∼23 in abstractïijŇthe present tense and past tense are mixed in the same sentence. Appropriate modification? E.g. < Although eddy splitting and merging are ubiquitous in the ocean, they have different geographic distribution in the Northern Pacific Ocean. Both the merging and splitting rates of the eddies are high, especially at the western boundary, along major currents and in "eddy deserts."> I am also not a native English speaker. please refer to other reviewers about the grammatical issues.

5. L489 In the Conclusion, <"MEI" and "GEM" computer codes. . ...>. Can the authors add some sentences about the codes? E.g.The code language is matlab, fortran or C? how to reserve/save the genealogy tree information in figure8b ?

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