Ocean Science
Discussions

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Interactive comment on "Sensitive dependence of trajectories on tracer seeding positions – coherent structures in German Bight surface drift simulations" *by* Ulrich Callies

Anonymous Referee #2

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Here, I try to provide my comments about this manuscript.

In general, the topic is appropriate for this journal, and I'm not aware of a similar study for the German Bight, which it makes it worth of publishing.

The used tools (PELETS in combination with surface current velocities obtained from BSH) are state-of-the-art and appropriate. Furthermore, the different quantitative measures to identify Lagrangian Coherent Structures (LCS) or objects with similar meaning are appropriate.

I must admit I'm not an expert for LCS and similar structures. However, reading the article and the theory included was very informative and helpful for me. Furthermore,

using more the one quantitative measure is quite illustrative.

Major comments and questions:

- Tides are very important for this region. Might it be possible to give some idea how and if the FTLE structures will change when tides are not subtracted from the currents. So, what might happen when not using residual currents.

- It was very illustrative to sea how variable the FTLE structures are in time. What would happen, if one considers time averaged FTLE-fields. Perhaps averaged over a season or half a year. Will there be stationary or more robust FTLE ridges visible?

- Instead of showing the temperature and salinity fields, perhaps one could use the density distribution. Would this do any difference to the interpretation of the relationship between FTLE ridges and T/S fields.

Some minor comments and questions:

- How do you calculate the residual currents from the BSH data? The current velocities of the BSH include tides, which are important for this region. Are the results dependend on the way these residual currents are calculated?

- Do you think it might be helpful to plot the absolute value of the gradient of temperature or salinity instead of the pure fields. So, one could see the sharp fronts more clearly.

Some direct comments to the text:

- Line 13: Gap at the end of sentence; (2017). Stanev . . .

- Line 143: The year of the Huntley citation is missing

- Equation (5): It is divergence of the 2d surface velocity field, isn't it?

- Figure 2a: The endpoint of the red drifter starting at 54 30' is missing?

- Perhaps one could also include the river Ems to the plots.

- Figure 4, caption: ... times of the FTLE fields ... ?

- Additional figure S3: The unit of salinity should be different from PSU. Perhaps no unit or g/kg

C3