

## ***Interactive comment on “Structure and dynamics of mesoscale eddies over the Laptev Sea continental slope in the Arctic Ocean” by Andrey Pnyushkov et al.***

### **Anonymous Referee #2**

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The authors investigate eddies in the Eurasian Basin by using velocity, temperature and salinity measurements from two moorings deployed at the Laptev Sea continental slope. A wavelet analysis is used to identify eddies, and properties of eddies like vertical extent, polarization, radius. Rotational current speed are computed. Moreover, the authors use climatological fields of temperature and salinity to identify the eddy origin. The topic of the paper is of high relevance, since up to now not much is known about eddies in the Arctic Ocean, particularly in the Eurasian Basin. This paper will be an important contribution to the existing literature. However, I have some concerns regarding the scientific results, and also the presentation of results. Therefore, I would suggest major revisions.

C1

Main point: My main concern is about the identification of eddy origins. The authors use climatological temperature and salinity to track the origin of eddies in the Arctic Ocean. There is lots of variability in the hydrography, from short term to seasonal and interannual variability. This is however not taken into account in their analysis. In my opinion, section 4 is very speculative. It might be appropriate for the discussion part, but not as a results section. This would also affect Figures 10, 11 and 12, which show properties for the two origin areas separately. Also, the travel distance of eddies (around 1400 km from the calculated eddy origin to the mooring location, page 11 line 10) seems to be very large. Is it realistic to have these large travel distances? Are there any other studies about travel distances of eddies in the Arctic Ocean?

Detailed points:

Section 2.2: It would be good to describe the wavelet analysis in more detail.

It would be interesting to see salinity and density anomalies of eddies. For temperature, this is shown in Fig. 10. How would this look without considering the origin of eddies? How does this look for different depths?

P2, L16: Could you reformulate this paragraph? You are jumping from a description of Fram Strait eddies to eddies in the Eurasian Basin, without introducing this region. Also, the abbreviation EB hasn't been defined before.

P3, L9: Is the depth range 216-800m correct? That would be the same depth range as in the time period before.

Figure 1: distinguished -> distinguishable

Figure 3: Colorbar is missing.

Figure 4,5,8: Labels of the colorbar are missing

Figure 11: What are red, black and blue lines in Figure 11a and 11b? Also, the x-axis of plots a and b should be labeled.

C2

Also, I would suggest to check the grammar again.

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