Dear Reviewer,

We greatly appreciate your constructive comments. Below we provide detailed point-by-point responses as well as changes performed in the new version of the manuscript regarding the comments. Modifications in the revised manuscript are shown in green.

1. Authors state that "The wind significantly affects the local circulation" in the region. However, results indicate that the model reconstruction is not sensitive to the number of ensembles used (with ensembles generated from perturbing wind forcings). Does this indicate that the assimilation scheme is not sensitive to the number of ensembles used or that perturbing winds do not significantly impact model trajectory? The domain is described as a "tide dominated basins" in line 254 but later results suggest that modifying the wind-forcing scheme has a significant impact on model outputs.

We agree with the reviewer on this point. In fact, circulation in the Eastern Channel is dominated by a combination of wind and tides, which is supported by the results of our study. The two major forcing terms are taken into account when selecting ensemble members. This is why; after correcting the wind-induced velocity, the relative error does not change (Tab.1, columns 3,4), which also proves that the model trajectory is effectively modified by OI. The only one quantity affected by this correction is the separation distance during S2 (columns 6,7). According to the Reviewer's comment, the text in lines 287-289 has been modified.

2. There is a concern that the data being assimilated into the model is also being used to evaluate the performance of the model. Does this adversely impact the evaluation and bias towards assimilation schemes that weigh more heavily towards observation data? A cross-validation scheme is implemented where only one drifter is assimilated but it isn't obvious that these are independent. Are there other independent datasets such as in-situ sensors that could be used to confirm the robustness of the findings?

Thank you for your remark. This point has also been raised by Reviewer #2 and has been addressed. In accordance with the Reviewer's request, we changed the method of validation from "cross-validation" to "leave-one-out validation". Leave-one-out validation provides a much less biased measure of relative error compared to that used in cross-validation, because we repeatedly fit a model to a dataset that contains n-1 drifter trajectories. A new text describing the validation technique and the results has been added on page 14 (lines 327-333) of the revised manuscript.

Regarding the second part of the Reviewer's comment, a text has been added in section 5 (lines 446-451) Unfortunately, there were no high-resolution data in the study area during the drifters' deployment.

3. Does the wind correction scheme in (3) require information on drifter & model data for the entirety of the period? i.e. are corrections being made at time t using information available at time t+1?

The wind correction scheme uses data (drifter velocities and the model counterparts) for all time steps, i.e. for the entire period of measurements. Therefore, the correction coefficient c is obtained for the whole study area and the survey period. This is explained in lines 238-239. Nevertheless, it is possible to obtain a time-varying correction coefficient. This was not our strategy given the short duration of the observation period.