This work addresses the general issue of taking best advantage from dense and high-resolution satellite observations, in particular satellite sea surface salinity (SSS) data, to improve our prediction and knowledge of ocean dynamics. One main difficulty relates to the large discrepancies between observation and forecast ensembles that can appear in frontal regions due to mismatches of the sky type (clear versus cloudy). These large discrepancies may induce unphysical analysis corrections in frontal regions. To overcome this issue, the objective of this study is to adapt the AOEI method (adaptive observation error inflation based on Desroziers' innovation diagnostics) to an EnKF-based ocean data assimilation (3D-LETKF formulation with 100 members). The AOEI provides thereby a way to inflate observations errors with a spatial dependency.
In this paper, the Authors study the AOEI impact on salinity structure, geostrophic balance and accuracy in the northwestern Pacific region when all-sky infrared brightness temperatures are assimilated at one-day time intervals. They illustrate the degradation of the salinity structure resulting from EnKF analysis without AOEI and impacting vertical diffusion. They also demonstrate that including AOEI within the EnKF can successfully limit the erroneous analysis increments and thereby preserve the salinity structure.

I find that the paper is generally well written and clear. The issue raised in this work is of great interest for the geoscience community because it is essential to be able to take advantage of current and future satellite observations to improve model predictions. The case study and results are relevant to answer this question.
I also find that the introduction shall put more emphasis on the objectives and on the issues associated with data assimilation when dealing with structures/patterns and therefore position errors. This is a general problem of standard data assimilation algorithms, which have been designed to handle amplitude errors and not position errors. The AOEI method provides a way to limit the issues of position errors in areas where observation errors may also be large. However, it would be of interest to readers to replace this issue in the more general context of position error treatment in data assimilation systems. Adding some comments in the introduction and conclusion on this aspect would be worthwhile.

By the way, I find that the paragraph "As shown in section 3, an EnKF-based ocean data assimilation system… are large due to fronts and eddies." (l. 69-72) is not at the right place in the introduction. It is surprising to announce in quite significant details the results found in the paper directly in the introduction. I suggest the Authors to modify/reformulate this part to further discuss the idea of position errors.
Also, in lines 325-329, there is a discussion on the limits of the SST, SSS and SSH assimilation due to the prescribed vertical localization scale. It is not clear in the text if this limit is satisfying or if there is some work to be done to overcome this limitation. How was this localization scale defined? How does it impact the vertical diffusion processes discussed in the paper? Comment on this aspect would be valuable.

(*) Some additional minor comments
I encourage the Authors to
- Throughout the manuscript, change "1 day" to "one day"
- Throughout the manuscript, write "Section" with a capital letter at the beginning of sentences, and use the abbreviation "Sect." within sentences.
- l. 15, correct typographical error "by combining forecasts and observations"
- l. 40, add references related to variational approaches for ocean data assimilation
- l. 42, correct grammar error "provide a large number"

- l. 147, remove the reference Ohishi et al. (in preparation): it is not conventional to cite a paper that is in preparation, it should be at least accessible in some ways.
- l. 169, remove the word “taking”
- l. 171, precise what is meant by “the accuracy” (the accuracy of what?)
- l. 350, define the acronym SSHA the first time it appears in the text
- Bibliography, modify the year for reference by Desroziers et al. (2005)