

Dear Reviewer,

Thank you for your detailed review and constructive feedback on our manuscript. We have studied comments carefully and have made correction.

1. In Fig.10, please amend error bar to illustrate the standard deviations in hourly , monthly and yearly eddy numbers; amend the inter-annual changes. And, accordingly, the impacts of cloud cover on the above patterns should be discussed. It will be much better if the cloud dataset is presented.

Reply: Thank you for your valuable suggestions.

Figure S1 shows the variation in the average number of eddies per hour, month, and year. Panels (a), (c), and (e) are plotted using the original dataset, while panels (b), (d), and (f) are based on cloud cover–processed data. It is evident that the number of eddies is significantly underestimated in the unprocessed dataset, and since cloud cover exhibits pronounced seasonal variability, this affects the analysis of seasonal eddy patterns.

In Figures S1(a) and (b), negative values for the number of eddies can be observed. This is because the number of eddies per day does not follow a normal distribution. Therefore, for the hourly eddy number statistic, I used the total number of eddies rather than the average count for statistical analysis. It is recommended that, when analyzing the spatiotemporal patterns of submesoscale eddies using this dataset, focusing on data from a specific hour would be more appropriate. The original Fig. 10 primarily illustrates the temporal distribution of all eddies within the dataset.

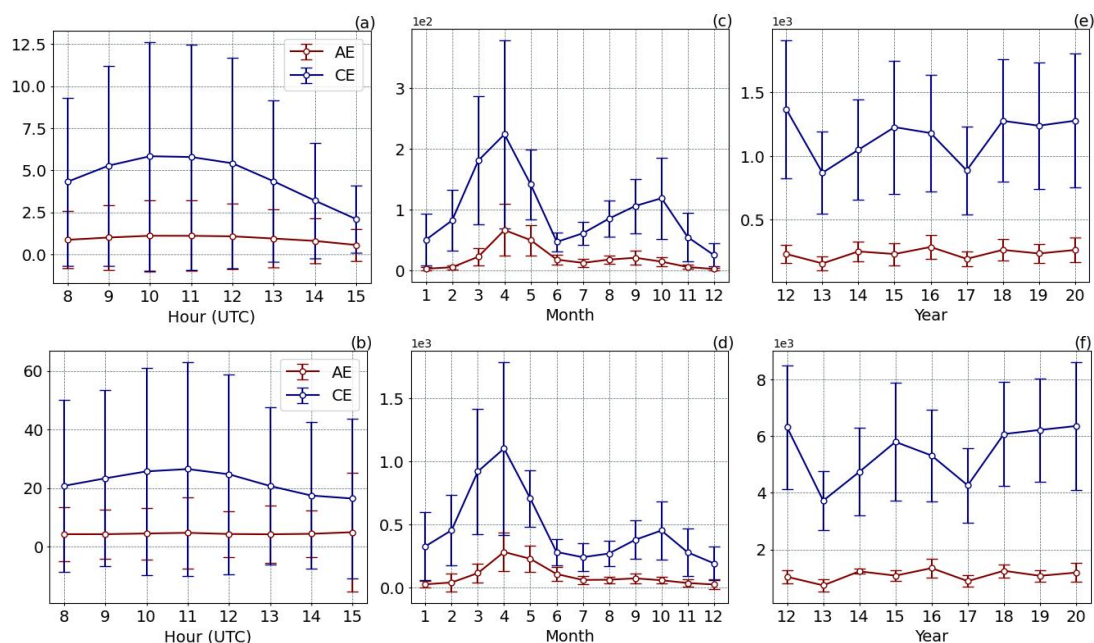


Figure S1: The average number of eddies per hour, month, and year. Panels (a), (c), and (e) are drawn directly from the original dataset, and panels (b), (d), and (f) are drawn from cloud-processed data.

Cloud cover does not directly affect the number of eddies but instead leads to missed detections by obstructing satellite imaging. We have uploaded data on the probability of cloud cover for each month, hour, and grid cell (values range from 0 to 1, with higher values indicating a greater probability of cloud cover; the file is named HH_MM_cloud_probability.pkl) to the Zotero site (DOI: 10.5281/zenodo.13989785).

Thank you once again for your valuable comments and suggestions. We believe these revisions will enhance the quality of our manuscript.