We deeply appreciate the reviewers comments and their effort in reading and reviewing our manuscript. The reviews have helped us improve the study and manuscript. Below is our point-by-point reply to the review comments with the reply marked in blue.

REVIEWER 1

The authors employ Masked Autoencoders (MAE) to tackle the challenge of filling gaps in high-resolution (1km) sea surface temperature (SST) fields arising from cloud cover. These gaps often lead to discontinuities in the SST data and produce blurry imagery in blended SST products. Their work demonstrates that the application of this machine learning method yields significantly superior results when compared to traditional optimal interpolation techniques.

The analysis is robust, and the results appear to possess credibility. The authors deserve commendation for their noteworthy contribution and the compelling nature of their paper. While the paper is generally well-written, there are a few minor improvements that could enhance its quality, as outlined below.

Figure 11: It would be beneficial to include additional realistic examples, perhaps at least one more, to facilitate a more in-depth discussion of differences between patterns. Consider showcasing results that incorporate realistic cloud cover scenarios. Moreover, evaluating the reconstruction over several days for the same area can help demonstrate the temporal consistency of the reconstructed fronts.

Thank you for the comments. We agree and have added additional panels to demonstrate the reconstruction with more realistic cloud cover, taken from actual VIIRS SST data. To evaluate performance, we used the same clear-sky SST image but applied realistic cloud shapes from another time. As noted in our initial submission, continuous cloud cover over a large area significantly degrades performance of MAESSTRO as well as other methods, simply because we do not have enough information. Addressing this limitation is the focus of our ongoing study. We have not conducted further studies with multiple days of analysis using VIIRS SST beyond one single snapshot. The robust statistical evaluation on multiple days (one year in our study) was given in Figure 7-9, we believe that these analyses serve the purpose of robust proof of statistics. We are in the process of conducting the same global statistical analysis using real satellite SST data, but this work is substantial, and we plan to dedicate that analysis to our next manuscript.

Discussion Section: The paper could be strengthened by presenting a reconstruction over an extensive area with continuous cloud cover. This would help in assessing the limitations and boundaries of the extensive area. Quantifying these limits can provide valuable insights.

Now we updated Figure 11 to include a mask derived from a real SST image with cloud cover. The cloud masks are also included in the figure for clarity. The real cloud incorporated in the revision has bigger continuous coverage to demonstrate the limitation of the ML method for continuous cloud, which is our ongoing research work.

Our response to reviewer 2's similar comments is "In our current version, we discard any 4x4 patch that contains even a single missing value due to cloud cover, as shown in Figure

11. This approach is not ideal, but it is deliberately designed to demonstrate the worst-case scenario that MAESSTRO must handle. Our future development will focus on improving the algorithm to manage patches with minimal missing values. This may include applying interpolation to fill in small-sized cloud cover before feeding it to the machine learning model, or working with smaller areas and smaller pixel sizes to retain more valid data points. These enhancements are part of an ongoing effort."

Figures: It is recommended to recreate figures such as Figures 10, 2, and 7 with larger dimensions and include informative titles to improve their clarity and comprehensibility.

Thanks. It is done.

By implementing these minor adjustments, the paper can further enhance its impact and deliver a more comprehensive understanding of the authors' contributions.

We thank the reviewer again for the constructive comments.