

The manuscript by Liu et al. presents in-situ observations of marine CO<sub>2</sub> concentrations using three low-cost sensors deployed at a sea-air interface buoy platform. The authors applied an environmental correction method to calibrate the sensors, thereby enhancing data quality. Additionally, they analyzed back trajectories to investigate potential sources and transport pathways of air masses influencing the measurements.

Overall, this work provides a viable method for monitoring marine CO<sub>2</sub> and shows the potential of low-cost sensors to expand regional oceanic CO<sub>2</sub> observation networks. The study aligns well with the scope of AMT. I recommend that it be accepted after addressing the following general and specific comments.

**General comments:**

1. If the sensors still remain deployed on the buoy platform, extending the time series to include the other seasons would enhance the dataset's value by capturing whole seasonal variability.
2. If the sensors have been retrieved, performing a post-deployment laboratory calibration against the Picarro instrument would be highly beneficial. This would allow for a direct assessment of sensor drift and long-term stability, further validating the field data's accuracy.
3. Discussing the sensors' long-term robustness and effective operational duration in the harsh marine environment would be of great interest to readers, as it is critical for assessing their suitability for sustained observing networks.

**Specific and technical comments:**

Line 193: the mentioned labels of subfigs do not fit to the contents. e.g. "A comparison between the laboratory and field results (Figure 4 c, d) shows that the CMs performed better under laboratory conditions." It looks like to be a, d.

"In the stable laboratory environment,  $\Delta\text{CO}_2$  exhibited no pronounced diurnal variation (Figure 4 c, e)", it looks like to be b, e.

Line 195:  $\Delta\text{CO}_2$  exhibited higher variability in e (in the field) than in b (in the lab). A temporal trend appears to be present over the 6-day period. This pattern is unlikely to be attributable to aging, given the short duration of the experiment. Please also provide an explanation for this bias.