Comment on os-2022-19

Anonymous Referee #1

Referee comment on "The role of tides and sea ice on the carbonate chemistry in a coastal polynya in the south-eastern Weddell Sea" by Elise Sayana Droste et al., Ocean Sci. Discuss., https://doi.org/10.5194/os-2022-19-RC1, 2022

The authors have written an interesting case study that nicely demonstrates how sampling bias can influence marine observations in highly dynamic environments in Antarctic coastal waters. They illustrate this with carbonate chemistry observations from a single location over 1-2 days during two separate years. The authors attribute the observed physical and chemical oceanographic changes to tidally induced currents and mixing.

Figure 2 shows the expected tidal influence (from a model) alongside the measured currents using an ADCP. Based on this figure alone, it is a little difficult to determine to what extent the tide dominates the observed current movement during the observational period. This is mostly due to the compressed y-axis on panels A, B, G and H. I think the authors have tried to address this with Figure F1, but maybe a plot of the residual u and v component might be more helpful here, or perhaps a progressive vector diagram that shows the trajectory of a water parcel during each period? If tides really are dominant then the water parcel, of course, would pretty much end up back where it started. Although as the authors mentioned in Line 286, the net transport during the experimental period appears to be to the south/southeast. Which would imply a transport path against the prevailing coastal/Weddell Gyre current?

Admittedly, this is a minor point. Even if the tidal influence was not as significant, the sampling bias problems that the paper is highlighting would remain unchanged. Finally, the caption in Figure D1 incorrectly labels panels C and D.