Reviewer 1 – Ruibo Lei:

We would like to thank the reviewer for their time and effort taken to contribute further comments and advice on our manuscript, as he has again aided in the analyses of this work. We have responded to all comments below.

In this document, the page numbers, line numbers, and figure numbers that we refer to in our answers relate to the revised final manuscript. All answers have been italicised.

Review on the revised manuscript "A contrast in sea ice drift and deformation between winter and spring of 2019 in the Antarctic marginal ice zone".

The paper has been revised in detail based on the previous round of review comments, and I do not have any further serious comments. Here, I mainly propose some specific revision suggestions. It can be considered for publication after some minor revisions:

1)It is better to provide a table to summarize the intensity, their relative position and distance from the buoy, and the duration of the impact of the encountered cyclones during operations of the buoy, in order to identify the differences in the impact mechanisms of cyclones with various characteristic parameters.

Answer: *We thank the reviewer for this suggestion. In our previous paper, Womack et al. (2022), we analysed the effects of individual cyclones on sea-ice drift and the wider MIZ extent. Therein, we provided a complete table (their Table 1) with corresponding figures of all passing cyclones (their Figs. 3 and 15), and how they impacted the local ice cover. Additionally, Vichi et al. (2019) provided a comprehensive investigation of the impacts that ice-landing cyclones have on the Antarctic MIZ. Herein, this manuscript rather utilizes the information, provided by these two previous studies, on cyclonic events to better understand ice drift and deformation in the context of the balance between ice type and external forcing (i.e. momentum transfers). Additionally, all previously requested information has been already added to this manuscript. Therefore, to keep the it the same length we would have to remove several components previously requested by the other reviewer. Subsequently, we also believe this would take attention away from the ice drift and deformation characteristics – a large focus of our manuscript.*

2)Line 45 "eventually consolidate into a coherent ice sheet", It would be better change to "ice cover", because the "ice sheet" is generally considered to be an ice sheet over the Antarctic continent, but not sea ice.

Answer: *Thank you for this suggestion. It has been changed in the revised manuscript (line 45).*

3)Line 50 "where waves can freely propagate"--In fact, even if the sea ice has fragmented, it still has a certain dissipating effect on the waves. Therefore, waves still cannot spread freely.

Answer: *Thank you for this comment. We have changed the wording to "… more freely propagate" (line 50).*

4)Line 404 "The magnitude and timing of the peaks remained the same, indicating that the relative motion in connection with the passage of the cyclones is realistic"-- I think this can indicate the high-frequency components, which correspond to periods less than 4 hours, have no significant impact on the kinematic parameters of sea ice.

Answer: *Thank you for this comment. This may be true, however in the context of our study, we re-computed the meander coefficient and TSEs to show that the difference in sampling frequencies, between the ISVPs and Trident, made no significant change in the results of the drift kinematics.*

5)Line 419 "Noteworthy, are also the minor fluctuations of all dispersion components during spring" This is not a complete sentence.

Answer: *Thank you for this comment. We have changed this sentence to: "It is also noteworthy that there are minor fluctuations in all of the dispersion components during the spring season, …" See lines 419-420 of the revised manuscript.*

6)Line 424 "During both seasons, increased local TSEs occurred with the passage of the cyclones, often before and/or after the cyclone core was closest to the buoys' locations" --Further explanation is needed as to why these parameters increased before the cyclone passes by.

Answer: *Cyclones in the Antarctic travel eastwards within the low-pressure belt, known as the circumpolar pressure trough (CPT) These ice-landing cyclones can cause rapid variations of the sea-ice cover. Amongst several other processes, they push the ice edge southwards as warm is advected poleward on their eastern flank, while also accessing a pool of cold air from the Antarctic continent on their western flank (Vichi et al., 2019). This results in the compression of sea ice, and the southward movement of the ice edge, which is then followed by the relaxation and northwards movement of the ice edge after the cyclone, when southerly winds prevail. Subsequently, the ice edge is re-arranged in a clockwise direction (Vichi et al., 2019). We have included a summary of this in lines 425-427 of the revised manuscript.*

7)Line 426 "TSEs allow to further distinguish the compression and the stretching, with the latter always observed after the former". --Further explanation is also needed why the stretching always occurred after the compression.

Answer: *This has been answered in question 6.*

8)Line 454 "allowing for opening of leads and rafting of floes"-- ice rafting only appears when the ice is very thin.

Answer: *We agree with this statement, and as reported in lines 649-652, heterogeneous (pancake-ice) conditions like the ones observed during deployment persisted during the 2019 winter period. Therefore, the ice cover remained young ice (≈ 40 cm thick; line 147), which raft under the action of winds and waves.*

9)Line 483 "The Winter buoys exhibited high wind factors ranging between 3.16% and 3.78%, with small turning angles ranging between -7.89° and -11.19°"-- These numbers only need to be retained to one decimal place.

Answer: *We thank the reviewer for this comment. However, we would prefer to keep them to two decimal places, since it does provide increased accuracy. Additionally, all of our other parameters (e.g. inertial period and correlations) and measurements from our previous manuscript (Womack et al., 2022), are provided to two decimal places. Therefore, this will keep consistency within the manuscript. If needed, readers also will be able to round up to one decimal place for their preferences.*

10)Line 539 "We attribute this to the long period of high pressure between the 7-30 October (Fig. A1a), when strong winds persisted." -- Why does high pressure correspond to strong winds?

Answer: *During this period of high-pressure, the winds were not as erratic and variable (in speed and direction) as during the passage of a cyclone. Thus, with more persistent wind speed and direction, there was no generation of inertial oscillations, and the power continued to remain at the lower frequencies. This would be due to the direct transfer of momentum from the winds to the sea ice i.e. no generation of inertial oscillations.*