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Interactive comment on "Do pelagic grazers benefit from sea ice? Insights from the Antarctic sea ice proxy $IPSO_{25}$" *by* Katrin Schmidt et al.

Katrin Schmidt et al.

katrin7schmidt@gmail.com

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We would like to thank Kim Bernard for the very positive Referee Comment on our manuscript 'Do pelagic grazers benefit from sea ice? Insights from the Antarctic sea ice proxy IPSO25'. As the reviewer states our study follows several purposes: (1) Evaluation of source-specific trophic markers to trace ice algae derived carbon into Antarctic food webs. (2) Raising awareness of the multiple benefits that sea ice can provide for pelagic grazers: food (ice biota), but also a conditioning of the water column for phytoplankton blooms when ice retreats in spring. (3) Comparing some of our results with findings from the Arctic to broaden our understanding and stimulate cross-polar research.

While we will address the reviewer's 'Technical Corrections' in a revised version of the manuscript after invitation by the handling editor, we would like here to reply to the 'Specific Comment' that we assumed krill to remain at the same location over extended length of time.

Reply: We agree with the reviewer that the interpretation of trophic marker signals in relation to local features such as sea ice cover can be confounded by advection. Both drifter trajectories (Thompson and Youngs 2013, Geophys Res Lett) and modelling studies (Meyer et al. 2017, Nature Ecol Evol) have shown that advection as well as retention can occur in the Scotia Sea. Without detailed information of krill transport during our study, we did not discuss their origin or potential timescale of movement. However, we overcome the problem of temporal-spatial mismatch by focussing on trophic markers within the stomach content, which were likely ingested within the last few hours ('snap-shot') and are therefore representing the available food at the sampling location. For instance, if at a particular station, the ice marker is found in krill stomachs but not within suspended matter of the upper mixed layer (UML), we assume that ice-derived algae were ingested below the upper mixed layer. In contrast, muscle tissue has a slower turnover time than the stomach content and may still contain the ice algal marker several weeks after its ingestion. This gives an 'integrated signal' of feeding history and the opportunity to gain an overview on the role of ice algae as a food source in spring. We present these tissue-specific trophic marker concentrations and ratios in Table 2 and Fig. 9, and indicate that our approach focuses on trophic markers within the stomach on line 39 (Abstract), lines 359-370 (Results) and lines 497-499 (Discussion). However, we hope to revise this manuscript and in doing so we will carefully rephrase any potentially misleading text in the Discussion, and emphasise the advective nature of the environment.

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