General Comments:

Reviewer: *This study presents the first high-resolution circum-Antarctic grounded iceberg dataset…Overall, this study has considerable scientific value and application potential, and I recommend publication after minor revision.*

Response: We sincerely thank the reviewer for the positive assessment and for recognising the scientific value and application potential of our dataset. We appreciate these constructive comments, which are helpful for improving the rigour of our manuscript and the usability of our dataset. Below, we address each comment point-by-point and outline the specific changes we will make in the revised manuscript.

Specific Comments:

Comment 1: *Although the data publication page provides a general description of the main GeoPackage dataset… I suggest that the authors add a README file or a field-description table to the dataset, clearly listing the meaning, data type, and unit of each variable.*

Response: To enhance the usability and clarity of our dataset, we will add a comprehensive README file to the updated dataset repository. This file will provide an overall description of the dataset and detail the name, meaning, data type, and unit of each variable field, ensuring consistency with Table 1 in the manuscript.

Comment 2: *Page 5, Line 123: The expression "0.016 km2 (40 × 40 m)" is potentially ambiguous, because 40 × 40 m corresponds to 0.0016 km2 rather than 0.016 km2. … Therefore, I suggest that the authors clarify here that the minimum retained iceberg area is 0.016 km2, corresponding to 10 pixels at a 40 m spatial resolution.*

Response: We thank the reviewer for pointing this out. In the revised manuscript, we will correct this expression into "icebergs ranging down to 0.016 km2 (corresponding to 10 pixels at 40 m pixel spacing) "

Comment 3: *Page 6, Lines 139-140: The authors state that EW imagery was primarily used, while IW imagery was used to fill gaps in EW coverage. However, it remains unclear whether the algorithm directly performs cross-mode matching when two consecutive images over the same region are acquired in EW and IW modes, respectively, or whether IW imagery is only used to supplement spatial coverage and trajectories are continued only within the same acquisition mode. I suggest adding a set of comparison figures to visualise cross-mode matching, including the EW and IW scenes, the predicted iceberg masks under both modes, and the differences in iceberg outlines.*

Response: We would like to clarify that our algorithm does not perform cross-mode matching during the spatiotemporal tracking process. Because our tracking framework analyses repeat-pass imagery along the same orbital track, the image pairs used for cross-temporal matching within any given trajectory exclusively consist of the same acquisition mode and polarisation (e.g., matching EW-HV to EW-HV, or IW-HH to IW-HH). IW imagery was utilised solely to supplement spatial coverage where EW data were missing, rather than filling temporal gaps within a single trajectory sequence. To

prevent reader confusion, we will add an explicit clarification to Section 3.1.3 of the revised manuscript to emphasise that trajectory matching is restricted to consistent acquisition modes and polarisations.

Comment 4: *Page 10, Line 198: The manuscript states that repeat-pass images with temporal baselines of 12 days or multiples thereof were used for grounded iceberg identification for each orbital track. It is unclear whether all Antarctic coastal regions have at least two SAR images available for matching. I suggest that the authors clarify whether any regions had only a single valid SAR acquisition. If such regions exist, the authors should explain whether they were excluded from grounded iceberg identification.*

Response: We thank the reviewer for highlighting this detail. We would like to clarify that all Antarctic coastal regions covered in our dataset have at least two consecutive valid SAR images available, with a temporal baseline of 12 days or multiples thereof. There were no regions with only a single valid SAR acquisition within our observation window. Therefore, no coastal sectors were excluded from the grounded iceberg identification process due to a lack of temporal sequences. To ensure complete clarity for the reader, we will add an explicit statement to Section 3.1.3 of the revised manuscript.

Comment 5: *Page 16, Line 198: The authors use SIC and bathymetry data to remove iceberg candidates, but these auxiliary datasets have limitations in spatial resolution and accuracy. In particular, the AMSR2 SIC product has a spatial resolution of 10 km, which is much coarser than the scale of small icebergs. It may therefore fail to accurately represent the local sea ice conditions surrounding individual icebergs. As a result, some truly grounded icebergs may be incorrectly removed due to SIC uncertainty, leading to false negatives. I suggest that the authors further discuss this potential source of uncertainty.*

Response: We agree with the reviewer's insight. In the revised manuscript, we will add a dedicated paragraph to Section 5.2 (Limitations) discussing the uncertainties associated with the use of auxiliary datasets of different resolutions in the filtering process.

Comment 6: *Page 19-20, Lines 424-435: The authors state that the model shows strong cross-seasonal generalisation. However, the main validation area is a 50 × 50 km region in Adélie Land. Whether the validation results from this region are representative of the entire circum-Antarctic coastline requires further clarification.*

Response: We thank the reviewer for highlighting this point. As we noted in our response to a related query raised by Reviewer 1 (Comment 5), the Adélie Land region was selected for the cross-seasonal, full-year validation primarily because it consistently presents a highly complex environmental background—specifically, a challenging mix of open water, landfast sea ice, and fragmented pack ice. This makes it an ideal, rigorous testbed for evaluating seasonal dynamics like summer surface melt.

To address the question of circum-Antarctic generalisation, we have provided comprehensive evidence in Section 3.5.1 and Table 5 (Extended Validation Dataset),

where we evaluated single-frame detection performance across multiple other distinct coastal sectors (e.g., Princess Ragnhild Coast, Princess Martha Coast, and Enderby Land), spanning various combinations of acquisition modes and polarisations. These robust metrics demonstrate that our model maintains strong spatial generalisation capabilities across different Antarctic margins.

Furthermore, regarding cross-seasonal performance in other regions, our analysis indicates that performance fluctuations are generally driven by specific environmental extremes rather than the geographic location itself. For instance, severe wind-driven sea clutter (mainly in IW mode, co-polarisation) or heavily deformed sea ice rubble can reduce the inherent radar contrast between icebergs and the background. Because these driving physical factors are not unique to Adélie Land, we expect the model to maintain a similar level of year-round stability across the entire circum-Antarctic coastline.