

Editor's Comment on tc-2021-119

General comments:

* Pls expand your discussion on frost flowers (I130), snow and other media especially with regard to their surface characteristics.

Discussion of snow has been added in the end of this paragraph. Discussion is added for frost flowers in Section 2.4, point 2, where the definition and characteristics of 'young ice' in this study is introduced.

* Title: The title is too long. Pls shorten.

I.e., "Cross-platform classification of level and deformed sea ice using incident-angle dependency of backscatter"

The title has been shortened to 'Cross-platform classification of level and deformed sea ice considering per-class incident angle dependency of backscatter intensity.'

* Abstract and much of ms is too verbose. Please shorten. I.e., omit phrases such as "To perform this task".

Shorten, i.e., from "ice-type-dependent change" to "ice-type dependency".

Remove wording such as "from co-authors ..." to read "expert knowledge of ice conditions during the Norwegian young sea ICE".

The abstract and ms have been edited to be more concise.

* Correct "e.g." to "e.g.," throughout the manuscript [ms].

Edited.

* Correct "in-situ" to "in situ" (in italics) throughout the ms.

Edited.

* Data are plural: Correct "data is" to "data are" throughout the ms.

Edited.

* Apply hyphenation correctly and consistently throughout the ms. For example in a sequence of three nouns, the first two are usually hyphenated. e.g., sea-ice deformation.

Edited.

Specific comments:

I80: Replace "of co-authors who participated in" with "from".

Edited.

I89: Provide reference for "Bayesian classifier".

Reference added.

I120: Specify "airborne surveys": Were these drone surveys, fixed wing? Clarify, if those "helicopter-borne and airborne surveys" coincided with your RS2 FQ scenes.

The description of in situ data has been deleted, as no in situ data is used in the analysis.

I123: Replace "'winter' period" with "winter".

Edited.

I128: Provide info if "second-year ice" was the only MYI observed during N-ICE2015.

Information added.

I130: Shorten "for the entire drift period of the campaign" to "for the entire N-ICE2015 drift".

Edited.

I132: Remove "in detail".

Edited.

I137: Provide data source and algorithm used or add reference/data DOI is using a product.

Source and citation added.

I138: Either provide reference to "87%. This is an empirically derived value" or rewrite to clearly state that this study has derived the 87% threshold. If the latter, pls provide sufficient data and methods.

This threshold was derived from visual inspection of the scenes. This has now been clarified.

I141: Replace "kept" with "retained".

Edited.

I143: Add "investigated" to read "investigated in 2019 (Table 1)."

Edited.

I143: Replace "time difference" with "temporal separation".

Edited.

I146: Add "manually" (or appropriate descriptor) to clarify: "overlap analysis is conducted manually".

Description added (overlap analysis is conducted through a script in GEE).

I155: Explain which criteria are applied to be "selected".

Explanation added (the one with the largest overlapping area is selected).

I157: Replace "same" with "identical".

Edited.

I157: Replace "erase" with "remove".

Edited.

I158: Move "is conducted" in front of "for S2".

Edited.

I159: Correct "these product" to "these products".

Edited.

I159: The first part of the sentence starting with "The final list" is not providing any content. And Tab. 1 is not summarizing the final list. Pls shorten. Similar to ".. shown in Figure 2". Both are 'empty statements' and should be avoided.

This sentence has been deleted.

I160: The references "(Gatti and Bertolini, 2015; Northrop, 2015; MacDonald Dettwiler Assoc. Ltd. (MDA), 2016, 2018)" are not connecting to anything here. Move to appropriate location.

This sentence has been deleted.

I164: Add reference for "The original GIA classifier".

Reference added.

I167: "this"? What is it referring to? Rewrite as "the spatial and temporal domain of this study"?

It's referring to the study of the original GIA classifier. This part has been rewritten as 'the spatial and temporal domain of that study.'

(But then the next sentence starts with "This study", too.)

I169: Replace "in winter" with "during boreal winter".

Edited.

I169: Correct to read "input of expert knowledge".'

Edited.

I170: "local" or "regional"??

Edited to 'regional' for this and other instances.

Caption Fig. 2: Replace "Boundaries" with "Extent and overlaps".

Edited.

I175: Correct "sea ice drift" to "sea-ice drift".

Also, briefly explain what the physics behind this: "accounting for their time difference (sea ice drift)".

Corrected for this and other occurrences of 'sea ice drift.'

Brief explanation added: "accounting for their time difference (change of ice types in the polygons across different scenes due to sea-ice drift)"

I183: Suggest to replace "spatial balance" with "spatial independence".

'Spatial independence' repeats the latter part of the sentence. 'Spatial balance' has now been deleted.

I186: Correct "the same number (20)" to "the same amount (20)".

Edited.

I196: Correct "their small extents" to "their small extent".

Edited.

I205: Suggest to change "to separate level and deformed ice" to "to separate level from deformed ice".

Edited.

I219: Change "ice) (Dierking" to "ice; Dierking".

Edited.

I219: Move "only" back to read "C-band HH and HV intensities only".

Edited.

Fig3: The polygon frames are very small in this presentation. Can the top 6 images be increased?

This figure has been re-edited, and more focused windows of each ice type have also been added.

Caption Fig. 3: Firstly, shorten "Dr. Polona Itkin" to "P. Itkin". Secondly, (photo) credits to a co-author: Suggest to use ", photos: P. Itkin)".

Edited.

I228: Rewrite "The experience from co-authors who participated in the N-ICE2015 campaign also shows" to "Observations taken during the N-ICE2015 campaign show".

Edited.

I229: Change "experienced little" to "was subject to little". "little rafting" sounds funny, suggest to rephrase.

Edited to "...show that rafting seldom occurred for young ice in the study area"

I230: Replace "in contact with thicker ice." with "close to thicker ice." Suggest to replace "thicker" with "thick".

Edited to "was close to thick ice."

I235: Remove "leads."

Edited.

I239: Replace "campaign" with "area" or "region".

Replaced with "region."

I240: Replace "histories for drifting ice parcels" with "history".

Edited.

I243: Correct "to:" to "as".

Edited.

I244: Correct "of the sequence" to "of the image sequence".

Edited.

I244: Correct "and with" to "at".

Edited.

I245: Correct "next day" to "subsequent day".

Edited.

I246: Correct "inside of the 300 m radius around each parcel centroid." to "within 300 m radius of each parcel centroid."

Edited.

I246: Add ", " to read "at every step,".

This part is re-arranged to read "At every step, each ice parcel accumulates counts of each deformation class, based on..."

l248: Correct "undeformed, predominantly convergence, predominantly divergence" to "undeformed, predominantly convergent, predominantly divergent".

Here the three terms serve as deformation classes, and are short for "undeformed, predominantly occupied by convergence, predominantly occupied by divergence." Therefore, we think it's appropriate to keep the current wording.

l249: Correct "Such Lagrangian parcel product is" to "These Lagrangian parcel products are".

Edited.

l249: Correct "that the parcels are tracked" to "of parcel tracking".

Edited.

l250: "vigorous deformation" or "episodic deformation"?

Edited to "episodic deformation."

l256: Correct "(CAs) in Figure 4 show that for all datasets," to "(CAs; Fig. 4) show that for all datasets".

Edited.

l260: Correct "(Figure" to "(Fig."

Edited.

l266: Correct "(Figure" to "(Fig."

Edited.

l267: Correct "mis-classification" to "misclassification".

This and other instances corrected.

l268: Correct "under-represented" to "underrepresented".

Edited.

l268: Correct "re-trained" to "retrained".

This and other instances corrected.

l269: Correct "(Figure" to "(Fig."

Edited.

l270: Correct "(Figure" to "(Fig."

Edited.

l276: Correct "(Figure" to "(Fig."

Edited.

l285: Correct "(Figure" to "(Fig."

Edited.

l286: Correct "(Figure" to "(Fig."

Edited.

l288: Correct "(Figure" to "(Fig."

Edited.

l289: Correct "(Figure" to "(Fig."

Edited.

l292: Correct "(Figure" to "(Fig."

Edited.

--> Pls correct all further instances to the end of this ms.

Edited.

l289 and 305: Avoid ", as expected" without providing explanation.

Deleted.

Tab2: Are HH-IA slopes derived in this and some cited studies more accurate than those cited in other studies? Either demonstrate or present all slopes to the same significant digit.

The numbers strictly follow their original forms in the respective papers. In this study we decide to keep three decimal points. This is now explained in the caption of the table.

l322: Provide reference for F-test: "F1 scores".

Reference added.

l324: Correct "(in black)." to "(Fig. 7, black lines)."

Edited.

l326: Correct "38 ° to 44 °" to "38 to 44 °".

Edited.

l483: Add acknowledgement to for the SentinelSat Python API (GPLv3+).

Acknowledgement added.