

Second review of

‘SAR deep learning sea ice retrieval trained with airborne laser scanner measurements from the MOSAiC Expedition’

The manuscript is significantly improved. I do have a few more comments. In addition, please read the entire manuscript carefully. I found a number of typos (some are listed below) but there may be others, and there are also spacing issues (words inserted without spaces).

- line 189 ‘of with’ should be with
- line 191 ‘fully layers’ should be fully connected layers
- line 195 ‘convolutions’ should be convolution
- line 202 lower case on ‘convolutional’ (it is not a proper name like Gaussian)
- line 203 ‘inter-label’ - this is different than in the reply to reviewers, where ‘intra-label’ was used. ‘Inter’ and ‘Intra’ label are quite different. Please clarify.
- line 278 ‘unknow’ should be unknown
- The categorical cross-entropy vs KL divergence part is unclear. Looking at Table 1, the train/test accuracies and train/test KL divergence are quite different, and even for some models (e.g. ConvNext) the trends are different (in that training accuracy is higher than test for train while for KLD test accuracy is higher than train). Why is this the case? Then, when I look at the caption for the table it says ‘standard deviation’ has been shortened to ‘std’ - but there is no std in the table. Again on line 250 reference is made to the mean and spread of the KLD but on line 213 it is stated the the cross-entropy is minimized in training. Please clarify these points.
- The wording for how the labels are generated I still find confusing. On line 136 it is stated a Gaussian distribution is assumed for the freeboard and reflection measurements. But in figure 2 freeboard and surface roughness are shown. Do the authors mean a Gaussian distribution is assumed for freeboard and surface roughness measurements? Continuing through this paragraph where it says the Gaussian distribution is integrated above and below the threshold - I am not sure the reader knows what this threshold is. You might mean (for example in the top right of fig2) where the color changes at a freeboard elevation of 0.4 so you are integrating the distribution to this threshold to determine the soft label for FYI etc. However, there are two PDFs shown on the right of Fig 2 (one for freeboard and one for elevation) - so presumably you integrate both to get the three classes considered (OW/YI, FYI and SYI shown in Fig 4). But this is not clear from the text. In addition the threshold mentioned in the text (searching for threshold) is for backscatter. This could be clarified by revising the text leading up to figure 2 and adding some subfigure labels (a,b,c etc). There are two sets of PDFs in the figure (one for the freeboard and surface roughness, and the other for the backscatter). Using subfigure labels would help by stating ‘integrating the PDF (fig 2a etc)’ so the reader knows what PDF and what threshold you are talking about.
- In Fig 4 SYI is a class but in elsewhere it is MYI/DI.