# Summary of Comments on Microsoft Word - Chan_Devon_TC_rev1.docx

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Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:23:07

see general comment - delete.
airborne radar or airborne radio-echo sounding

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:25:38

higher
I don't get this argument in the abstract, because not mentioned before.
Undefined, what higher frequency means here, can't be HF. Do you mean UHF?
Or rather high-resolution (cm-dm scale)?

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:31:00

IPR is nor very often used. We recenlty argued to get rid of this term altogether (Schlegel et al., Ann. Glac., 2023). Ice-penetrating is nothing else than ground-penetrating, where the ground is made of ice. However, GPR is usually refered to as ground-based. This becomes obsolete now that GPRs are also flown underneath helicopters. I support the statement of the reviewer here.
To be more consistent with the most used convention I suggest to replace IPR with RES (airborne radio-echo sounder). It is the term most often used in literature by now and also extended its meaning from the initial analog systems to modern multi-antenna phase-sensitive systems.

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:32:05

commensurately

This is not true for ultrawide band radars such as MCORDS5 - they can resolve firn layers of 1 m resolution.

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:32:40

Earth

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Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:33:17

GOG3
explain/write out once

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:34:47

/bandwidth
a bit unclear like this - rather
dual-frequency (i.e. different bandwidth)

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:37:20

Mention elevation contours in caption (i.e. from 600 m to ... m every 200 m).
I suggest to change dashed black to solid black, as dashed is particular unclear for zone IIb.

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:38:21

with

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:38:44

shouldn't this be CReSIS?

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Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:40:09

unclear. Suggested rewrite:
the radar return from the surface is influenced to a depth

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:43:24

relative or not?

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:48:23

below, k is the wavenumber. Chose a different letter here (please do not use k_w)

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:00:08

effective

Author: oeisen Subject: Sticky Note Date: 12.03.23, 10:01:41

later you use the ordinary relative permittivity. Please specify in the text, which one eps_eff denotes. Distinguish between absolute an relative permittivity by using subscript _r, if necessary.

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:44:57

ordinary relative permittivity

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:45:39

why between?
Rather of?

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:46:38
permittivity changes

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:32:11
surface reflection coefficient r:
power or amplitude? I assume amplitude, but clarify.

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:50:12
rms height: calculated over particular window length, all profiles or other?
Please specify.

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:47:38
k is the wavenumber

You must not use the same variable for two different purposes in the same manuscript - here windowing factor and wavenumber.

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:49:12
laser: specify: laser altimetry or laser scanning?
I assume airborne laser, please clarify

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:54:00
0.22 dB to Pc

Could you give a percentage of the average value of Pc? At this stage the reader did not see any Pc value, so does not know how (in)sigificant this is and later you say it is "conservative". Sufficient to say e.g.
"0.22 dB to Pc, i.e. less than x% in terms of dB."

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:50:41
sheet - this is an ice cap - replace

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:51:07
freshly fallen snow

Author: oeisen Subject: Hervorheben Date: 11.03.23, 13:51:39
can you further specify why? E.g. any data which indicate that? Please clarify

Author: oeisen Subject: Hervorheben Date: 12.03.23, 09:54:33
unlcear: should be along HiCARS2 transects. Please clarify.

Author: oeisen Subject: Hervorheben Date: 12.03.23, 09:55:42
picking the firn-ice interface in

Author: oeisen Subject: Hervorheben Date: 12.03.23, 09:59:35
ordinary relative permittivity

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:03:38

simply

"firn" layers

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:06:01

Please explain operators:
"The operator ||...|| denotes ... IFFT is the ..."

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:06:33

no tapering used?

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:09:05

as mentioned previoulsy consider to change dashed to solid black.

Add:
"Background and contours as in Fig. 1".
in fact you could also write
"Background, contours and firn boundaries as in Fig. 1." and remove the separate description of the firn boundary here.

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:22:41

aren't units needed for IQR in legend?

During copy-editing it might unfortunately be suggested again to put all three panels on top of each other to fill only one column in the final typeset version - in contrast to the reviewer's suggestions. I find the comparability in the previous figure version also more compelling than now.

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:15:41

of what?
the spatial distribution of the ratio?

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:17:31

This is ambiguous.
Pc is in dB
Pn is in dB
so their ratio would at first sight be unitless.

Or do you rescale the ratio again to dB by taking the logarithm? Please clarify, as also important for the figures indicating Pc/Pn

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:19:15

firn at the surface

I consider it important to clarify that satellite imagery/measurements can only indicate the properties at the surface, but not below (eg if there is left-over firn below an ice slab).

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:25:49

the surface signal probes

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:30:38

section Discussion).

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:36:31
resolutions of the surface reflection (i.e., z0)

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Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:42:03

Figure: as for previous figures, please add info on elevation contours in caption.

Regarding my comment in previous figures for the dashed black lines, the dash spacing here is small enough to indicate clearly the boundaries, whereas it is too wide in the previous figures.

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:44:44

Quite a long subscript. I suggest to put the radar system as a superscript instead to increas readibility.

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:50:50

also the

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Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:52:35

editor,

Author: oeisen Subject: Hervorheben Date: 12.03.23, 10:52:55

xxx.