



EGUsphere, author comment AC1  
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## Reply on RC1

Mathieu Le Breton et al.

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Author comment on "Monitoring snow water equivalent using the phase of RFID signals"  
by Mathieu Le Breton et al., EGU sphere,  
<https://doi.org/10.5194/egusphere-2022-761-AC1>, 2022

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Dear Christian Mätzler,

First, thank you very much for your in-depth comments. We have addressed or are addressing them. I would like to try the interactive possibilities of this open review to address one question/clarification. It concerns these comments :

- 5) No information is given on the scattering and absorption cross sections of the tags used, nor of the supporting structures.**
- 6) No information is given on the method used to discriminate the responses and the backscattered signals from different tags, and how this discrimination may be linked with the phase determination.**

Mainly, I do not see the motivation behind your suggestion to characterize the Radar Cross Section of the tags and supporting structure (comment 5). I think comes from a misunderstanding of the difference between a radar target and an RFID tag (comment 6), that we have clarified in the text. The answer to comment 6 is straightforward: one tag at a time is requested by the interrogator (using standard the communication & anti-collision protocol EPC Gen2) to modulate the signal it backscatters, while all the other tags and the environment backscatter a non-modulated wave (as it would do with a standard radar). The phase difference of arrival is measured between the two modulation states of the received signal, therefore linked only to the singulated tag.

Indeed in RFID, an important parameter is the DeltaRCS of the tags, which is the difference of the tag's radar cross-section between these two modulation state. We have characterized the DeltaRCS for the model of tag used (depending on frequency and input power). I can add this characterization in the 'instrumentation' section if you find it useful.

In the end, knowing how the response of each tag is discriminated, we do not see the reason for characterizing the cross-section of the tags and supporting structure (which would make sense however with a radar). Can you confirm me, or otherwise explain the motivation behind the comment 5 ?

Sincerely yours,  
Mathieu Le Breton, on behalf of all the coauthors.