egusphere-2022-761, "Monitoring snowpack SWE ....", Review 2022-09-08

General comments:
1) In this manuscript, the authors propose and test a new method for SWE estimation: the use of passive (or semi active?) tags for RadioFrequency IDentification (RFID) in a narrow frequency band around 866 MHz. Due to problems and difficulties with other methods used so far, as the authors correctly describe in the introduction, the use of RFID could be highly attractive. The frequency range is optimum with respect to penetration through any seasonal snowpack, primarily for dry snow. Even for wet snow the method may be used if the liquid-water content is known (and not too large).
2) The main difficulties are related to the determination of the total phase due to the short wavelength in comparison with the length of the propagation path, resulting in phase ambiguities. This problem can be solved by phase unwrapping if continuous observations exist. The authors found and described ways to overcome problems with short data gaps.
3) An unexpected problem came up by large phase uncertainties due to interference by multipath propagation of the sensing waves. The use of independent measurements helped in reducing these uncertainties. In my opinion, the problem is still severe and should be improved. The questions:
- what causes multipath effects?
- how can they be reduced?
have not been addressed by the authors. Ways to tackle these questions are by numerical simulations using a forward model or by experimental work.
4) No information is given on the properties of the antennas used.
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.
7) Information is also missing on how the temperature measurement of the tags is working.
8) An alternative to the vertical stack of tags would be tags close to the ground surface in a type of (phased?) array. The tags close to the ground are the ones that gave most of the information.

Details:
1) English language should be improved.
2) Improve the final part of the Introduction, sentence on lines 74-75, and "Section 0", lines 85 to 88.
3) After Equation (1): "in-phase and quadrature" are generally used to describe the complex electrical field of electromagnetic waves. Don't use it here for the complex dielectric constant.
4) Section 2.1 **Theory: from phase delay to SWE** to be improved and simplified as a whole.
5) Section 2.2 **Instrumentation** does not present the instruments and their properties. I missed this description, see general comments above. The subsection describes experiments and sites.