Authors' comment:

Dear Editor,

Thank you for your question. Mousavi et al. (2022) modeled the dielectric constants of medium 2 (wet snow) and medium 4 (semi-infinite dry snow) in a four-layer configuration using the formulations of Ulaby and Long (2014, Chapter 4, pp. 140–145, Eq. 4.55 – 4.61). However, they explicitly prescribed the complex dielectric constant of medium 3 (the highly reflective layer) as 3.5 – 9j. For details, please refer to Table II in Mousavi et al. (2022), where the layer properties of the four-layer model are listed (corresponding to the Fig. 3b where the semi-infinite air medium was considered as a separate layer).

While we follow a similar modeling approach, we use different values for the complex dielectric constant of the reflective layer ($\varepsilon_2 = \varepsilon_r - 0.0002$j), as we consider such high absorption (caused by loss factor 9j) to be unlikely in dry snow. Instead, we hypothesize that successive reflection caused by complex stratigraphy is the dominant mechanism. Therefore, we tune the real part of ε_2 to match the simulated and observed brightness temperatures at each grid point during the frozen season.

Sincerely,

Alamgir Hossan (on behalf of the authors)